



*Better Buildings Residential Network
Peer Exchange Call Series*

***Overcoming Homeowner Lack of Efficiency
Knowledge?***

November 18, 2021

Agenda and Ground Rules

- Agenda Review and Ground Rules
- Opening Poll
- Residential Network Overview and Upcoming Call Schedule
- Featured Speakers
 - **Wendy Koelfgen, Clean Energy Project Manager, Portland Clean Energy and Community Benefits Fund**
 - **Darren Jones, Chief Executive Officer and Co-Founder of MyHEAT**
 - **Joe Medosch, Healthy Building Scientist and Partner Development, Hayward Score**
- Open Discussion
- Closing Poll and Announcements

Ground Rules:

1. **Sales of services and commercial messages are not appropriate** during Peer Exchange Calls.
2. Calls are a safe place for discussion; **please do not attribute information to individuals** on the call.

The views expressed by speakers are their own, and do not reflect those of the Dept. of Energy.

Better Buildings Residential Network

Join the Network

Member Benefits:

- Recognition in media and publications
- Speaking opportunities
- Updates on latest trends
- Voluntary member initiatives
- One-on-One brainstorming conversations

Commitment:

- Members only need to provide *one number*: their organization's number of residential energy upgrades per year, or equivalent.

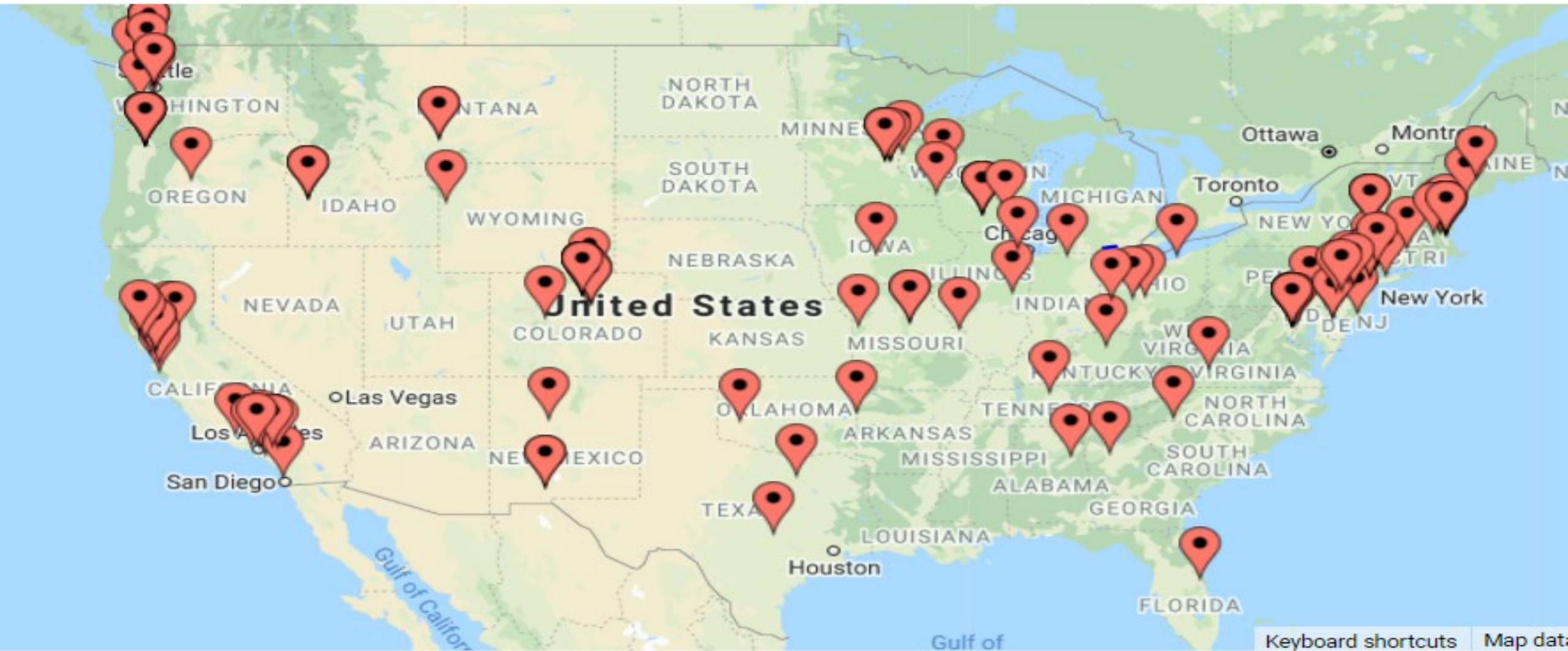
Upcoming Calls (2nd & 4th Thursdays), Except Holidays:

- 12/9: *Heat Pumps at Scale, the Game Changer – Where Are We Now, and What Will It Take?*

Peer Exchange Call summaries are posted on the Better Buildings [website](#) a few weeks after the call

For more information or to join, for no cost, email bbresidentialnetwork@ee.doe.gov, or go to energy.gov/eere/bbrn & click Join

Call Attendee Locations



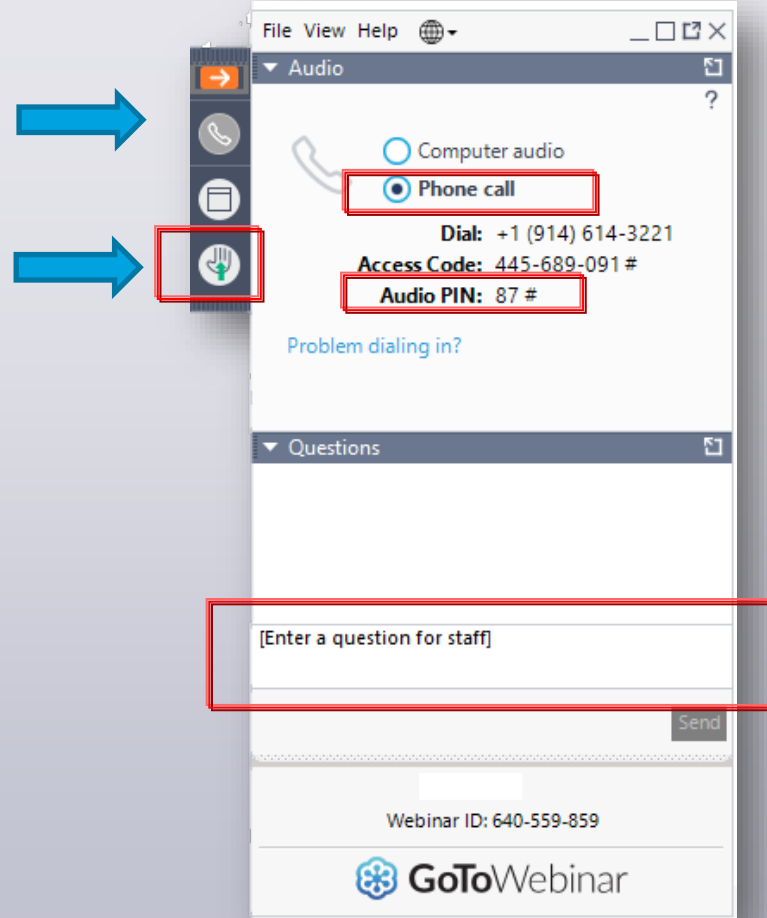
Opening Poll

- What is your organization's experience or familiarity with overcoming homeowners lack of efficiency knowledge ?
 - Very experienced/familiar
 - Some experience/familiarity
 - Limited experience/familiarity
 - No experience/familiarity
 - Not applicable

Discussion: Share Your Questions

Open and close
your **control
panel**

**Raise your
hand** to enter
the discussion



Please use the
questions box to
submit questions,
comments, or
alert us of
technical
difficulties

If you have called in on a phone today, double check that you've selected telephone as your audio option.



Wendy Koelfgen
Clean Energy Project Manager
Portland Clean Energy and Community Benefits Fund

COMMUNITY IS KEY



Portland Clean Energy Community Benefits Fund

Overcoming Homeowner Lack of Efficiency Knowledge

Better Buildings Residential Network

November 18, 2021

Wendy Koelfgen

PCEF Clean Energy Project Manager

PORTLAND
**CLEAN ENERGY
COMMUNITY BENEFITS
FUND**

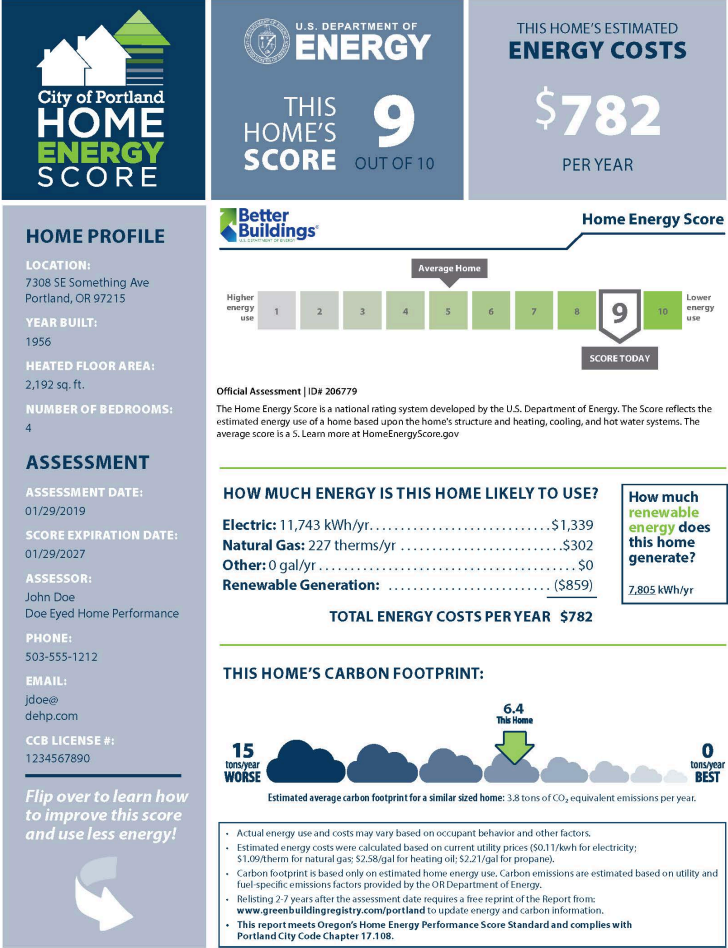


Bureau of Planning and Sustainability

VISIT US ONLINE portland.gov/bps/cleanenergy

PCEF

Home Energy Score



- TACKLE ENERGY WASTE TODAY!**
- Enjoy the rewards of a comfortable, energy efficient home that saves you money.
- ☒ Get your home energy assessment. Done!
 - ☐ Choose energy improvements from the list of recommendations below.
 - ☐ Select a contractor (or two, for comparison) and obtain bids. Checkout energytrust.org/findacontractor or call toll free 1-866-368-7878.
 - ☐ Explore financing options at communityenergypoint.org or energytrust.org.
 - ☐ Visit the following resources to learn about easy changes you can make today: communityenergypoint.org/services or energytrust.org/solutions/insulation-and-air-sealing/

*PRIORITY ENERGY IMPROVEMENTS 10 YEAR PAYBACK OR LESS ¹		
FEATURE	TODAY'S CONDITION ⁴	RECOMMENDED IMPROVEMENTS
Duct insulation	Un-insulated	Insulate to R-8
Envelope/Air Sealing	Not professionally air sealed	Professionally air seal
Heating Equipment	Oil furnace 60% AFUE	When replacing, upgrade to ENERGY STAR ³
Heating Equipment	Natural Gas/Propane Furnace	When replacing, upgrade to ENERGY STAR
Water Heater	Standard electric tank	When replacing, upgrade to ENERGY STAR, minimum 2.76 EF (Energy Factor)

ADDITIONAL ENERGY IMPROVEMENTS ²		
FEATURE	TODAY'S CONDITION ⁴	RECOMMENDED IMPROVEMENTS
Attic insulation	Ceiling insulated to R-0	Insulate to R-38 or R-49 if code requires it
Duct sealing	Un-sealed	Reduce leakage to a maximum of 10% of total airflow
Envelope/Air Sealing	Not professionally air sealed	Professionally air seal
Wall insulation	Insulated to R-0	Fully insulate wall cavities
Solar PV	Capacity of 7.8 kWh in DC	
Windows	Multiple types	When replacing, upgrade to ENERGY STAR
Air Conditioner	N/A	
Basement wall insulation	N/A	
Floor insulation	Insulated to R-0	
Foundation wall insulation	N/A	

1. To achieve the "Score with priority improvements" all recommended improvements in this section must be completed. These improvements have a simple payback of ten years or less.

2. Additional energy efficiency improvements may take longer than ten years to make a return on investment but can have a significant impact on the comfort, efficiency and environmental impact of your home.

3. If your home has an oil furnace it is recommended you replace it with a high efficiency electric or gas furnace.

4. Today's Condition represents the majority condition for that feature in the home.

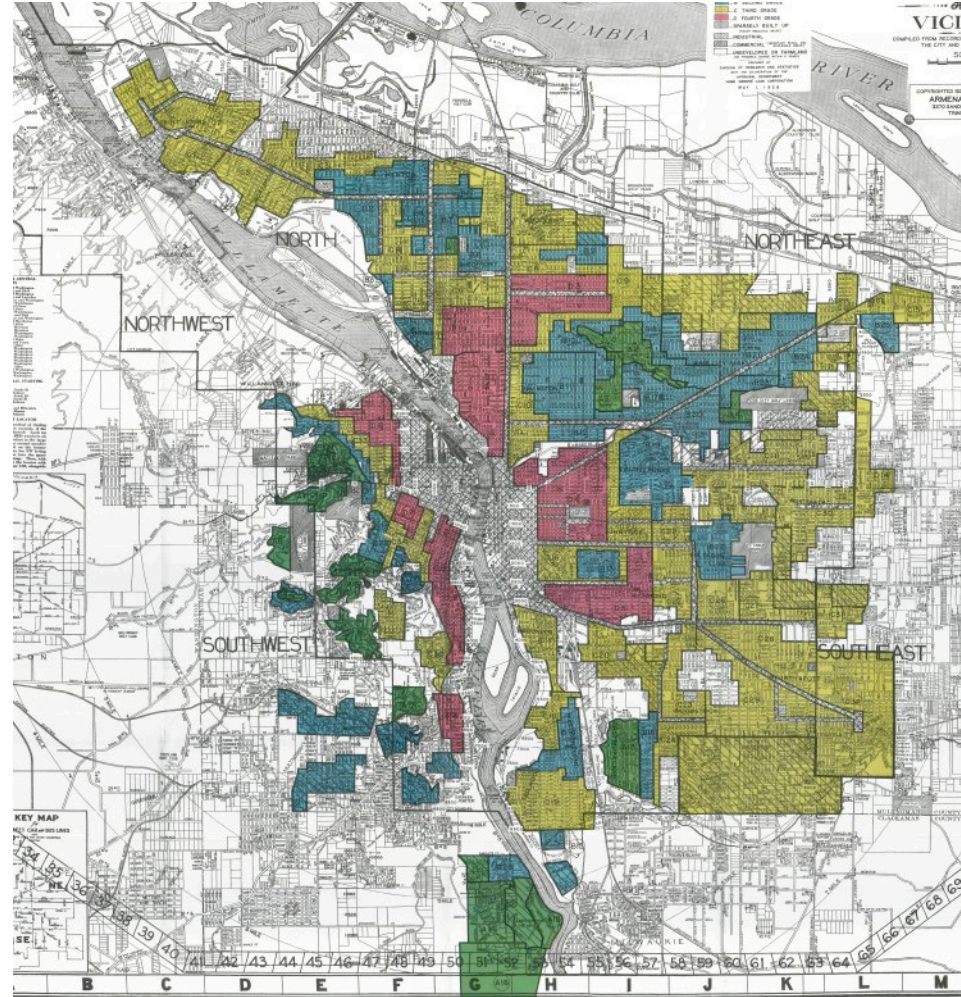
Same old efficiency conversation

- Two audiences
 - Middle to upper income households
 - Affordable, subsidized housing
- What about everything between middle-income and subsidized housing?
 - 39% of low-income households, own the home they live in

Why it matters

People of color and low-income people are most burdened by climate change and least connected to energy efficiency and clean energy opportunities. For example:

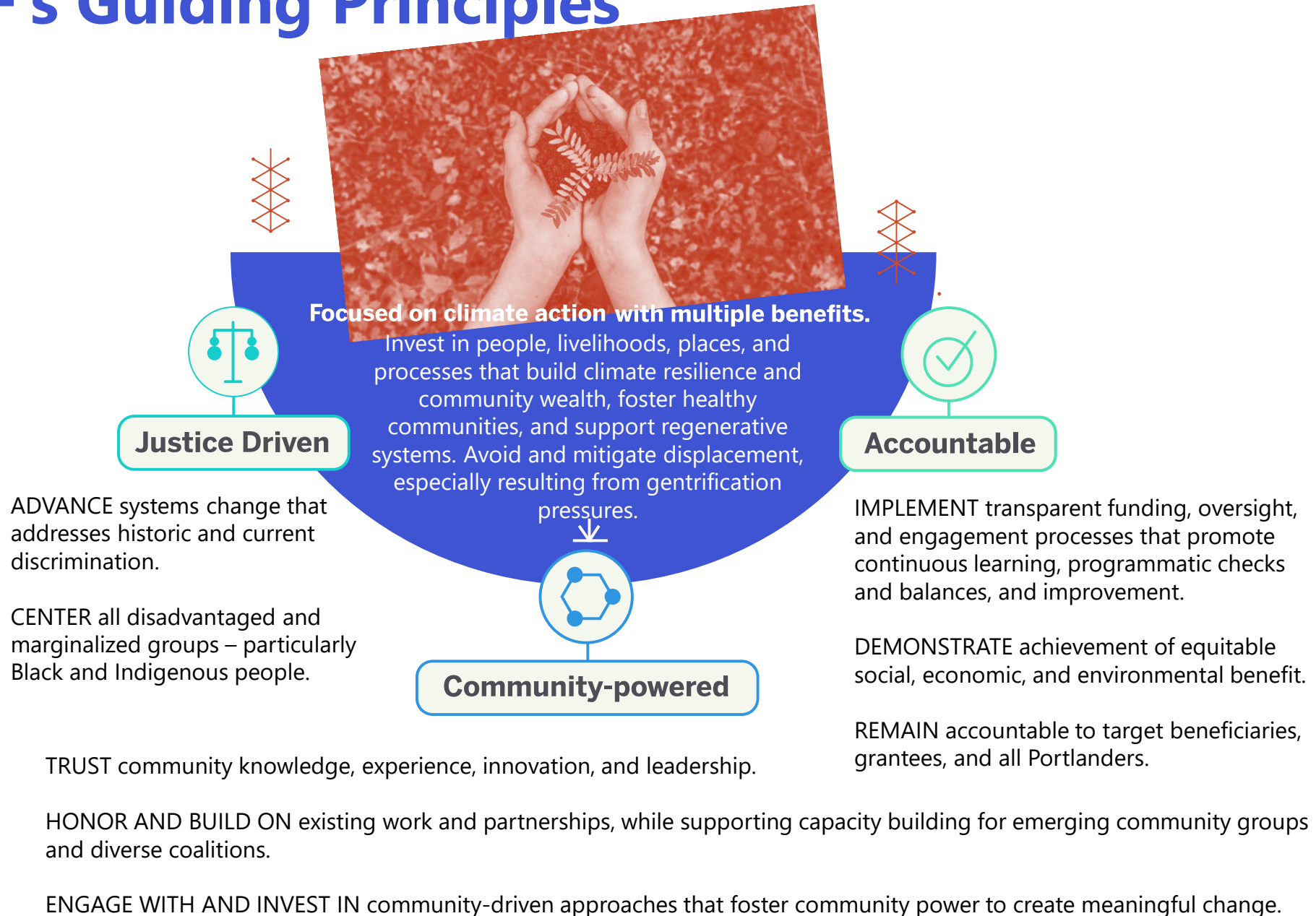
- Greater exposure, less access to adaptation
- Low-income energy cost burdened
- 40+ year history of energy incentive programs and tax credits that are economically exclusionary



What is PCEF?

- First climate fund measure created and led by communities of color in the US.
- Ballot measure passed by more than 65% of Portland
- Generates \$40-60M annually for clean energy investments in Portland
- 1% gross receipts tax on sales in Portland by corporations with \$1B+ sales nationally and \$500k+ in Portland. Exemptions for things like groceries, utilities.
- Invests in community led climate action that advances racial and social justice

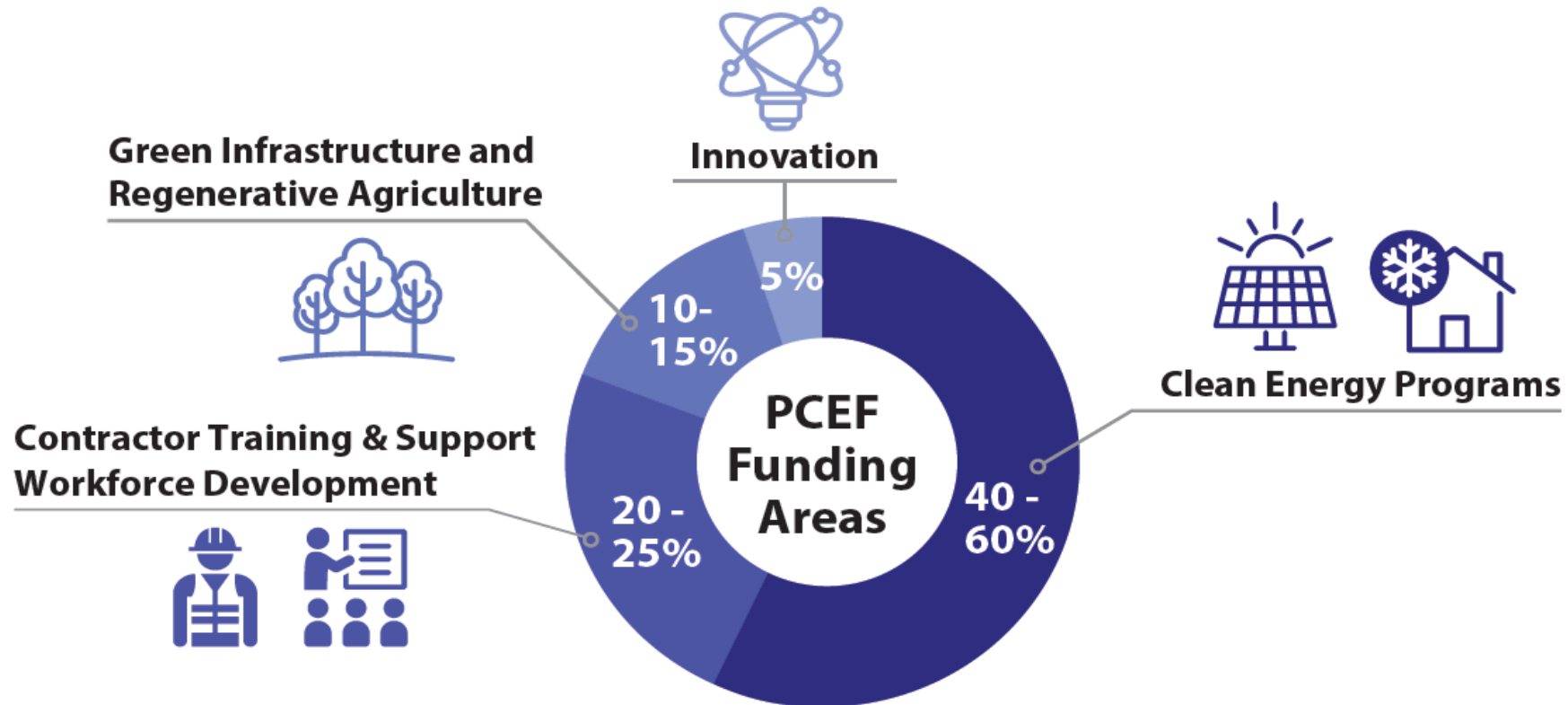
PCEF's Guiding Principles



PCEF Funding

Grants to non-profit organizations

Can partner with public, private, and non-profit organizations





Funded portfolio of grants for first PCEF funding round

Key Portfolio Characteristics:

Total Number of Grants : **45**

% of funds to organizations reflecting priority populations: **86%**

% of funds to small organizations: **38%**

Total estimated lifetime GHG impact: **11,500 metric tons CO₂e**

Clean energy projects:

- 20 deep retrofits on Black-owned single-family homes, 5 with solar PV
- 8 deep energy retrofits on single family affordable housing properties with majority black residences, and evaluation of 42 other properties
- Matched savings fund and curriculum development to support Black homeowner energy efficiency and solar PV investments
- Residential ductless heat pump installation program targeting 200 homeowners with stewardship dollars available for participants
- Deep retrofits of 15-20 homes of BIPOC owned households in Jade District

African American Alliance for Homeownership



Organization

- Mission to increase homeownership and economic stability for African Americans and other underserved individuals
- Home purchase to home retention and asset preservation
- Significant emphasis on homeowner education

PCEF project

- Use HES to scope projects
- Recruit and hire contractors based on the selected scope
- Combine PCEF funding with utility incentives and homeowner matching contributions
- Assist homeowners with financing or saving for match
- Substitute curriculum participation for match

Community Energy Project



Organization

- Free education and home safety, health and energy efficiency services including free Home Energy Scores
- Aimed at serving low-income renters and homeowners
- Organizational commitment to electrification

PCEF project

- Whole home energy retrofits for Black-owned single-family homes
- Solar integration in select projects
- Scopes are a collaboration of the homeowner and home energy assessor based on HES

Takeaway

- Tools like Home Energy Score aimed at appealing to a market rate audience can be put to use for a wider audience
- Culturally specific organizations funded to design, deliver and communicate about efficiency can use these tools to build projects and educate homeowners

COMMUNITY IS KEY



Thank you!

[Portland.gov/pcef-grants](https://portland.gov/pcef-grants)

Wendy.Koelfgen@portlandoregon.gov

PORTLAND
**CLEAN ENERGY
COMMUNITY BENEFITS
FUND**



Bureau of Planning and Sustainability

VISIT US ONLINE portland.gov/bps/cleanenergy

PCEF

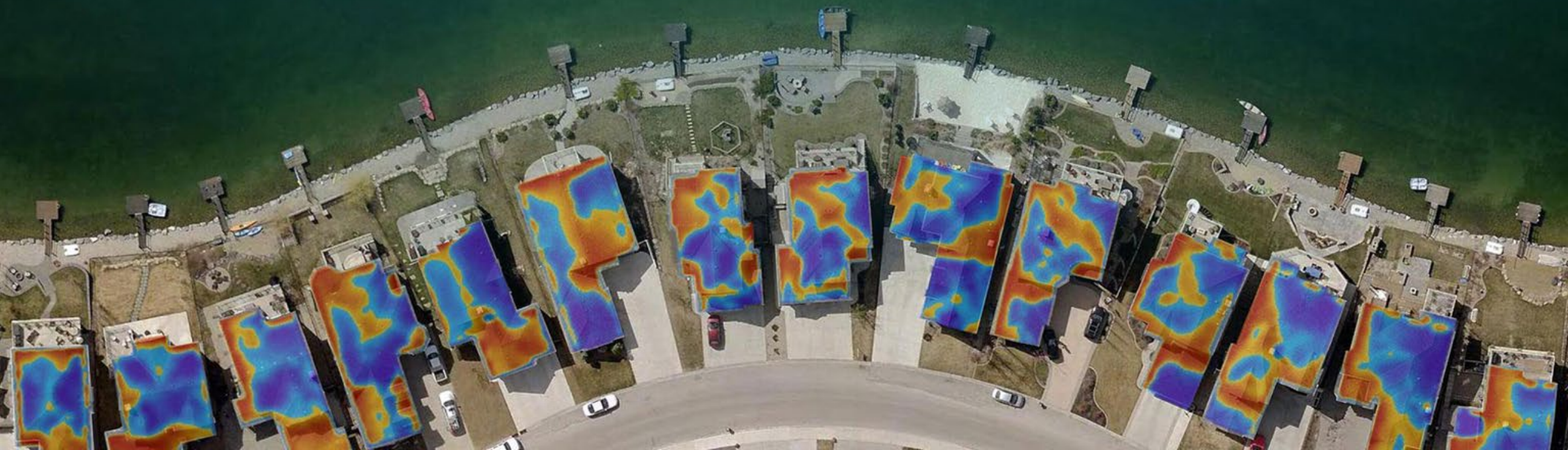


**Darren Jones,
CEO and Co-Founder of MyHEAT**



MyHEAT

Energy Made Visible™



Why show heat escaping from homes?



Under-insulated homes

84 million Existing Homes in the U.S., 9 out of 10 homes are under-insulated - Source: DOE



Cost-effective measure for energy savings

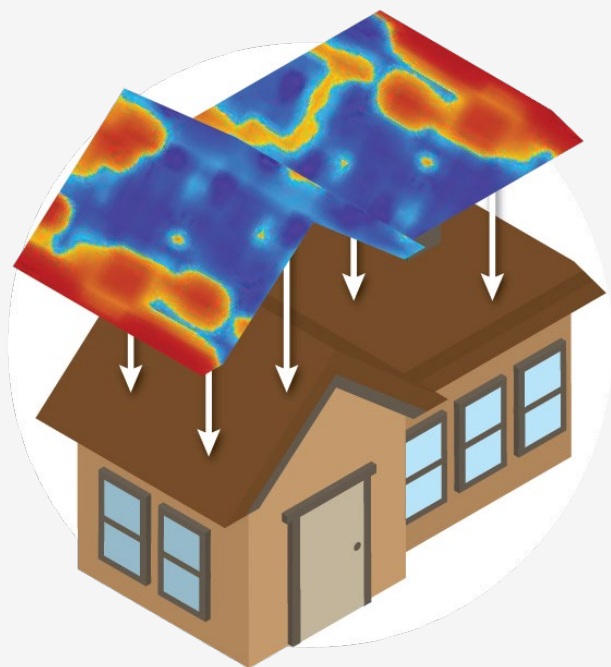
Commonly recommended improvement from home energy audits



Applies to all climate zones

Greatest energy savings in extreme cold and hot climate zones

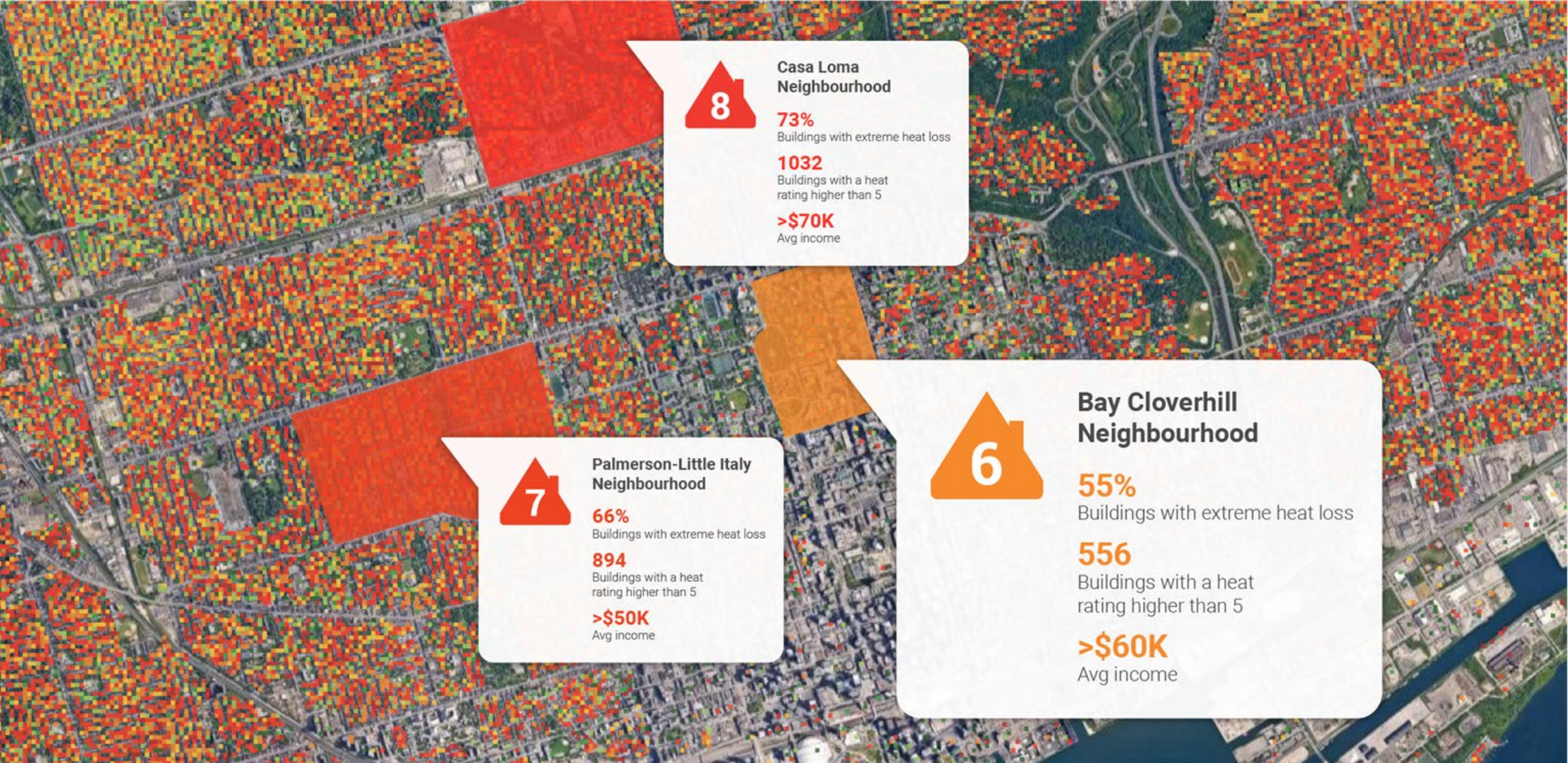




Processed images show where homes are losing the most heat in red and more efficient areas in blue.



Homes are rated 1-10, homes rated 6 or higher are the best targets for energy efficiency measures.



Casa Loma Neighbourhood

73%
Buildings with extreme heat loss

1032
Buildings with a heat rating higher than 5

>\$70K
Avg income



Palmerson-Little Italy Neighbourhood

66%
Buildings with extreme heat loss

894
Buildings with a heat rating higher than 5

>\$50K
Avg income



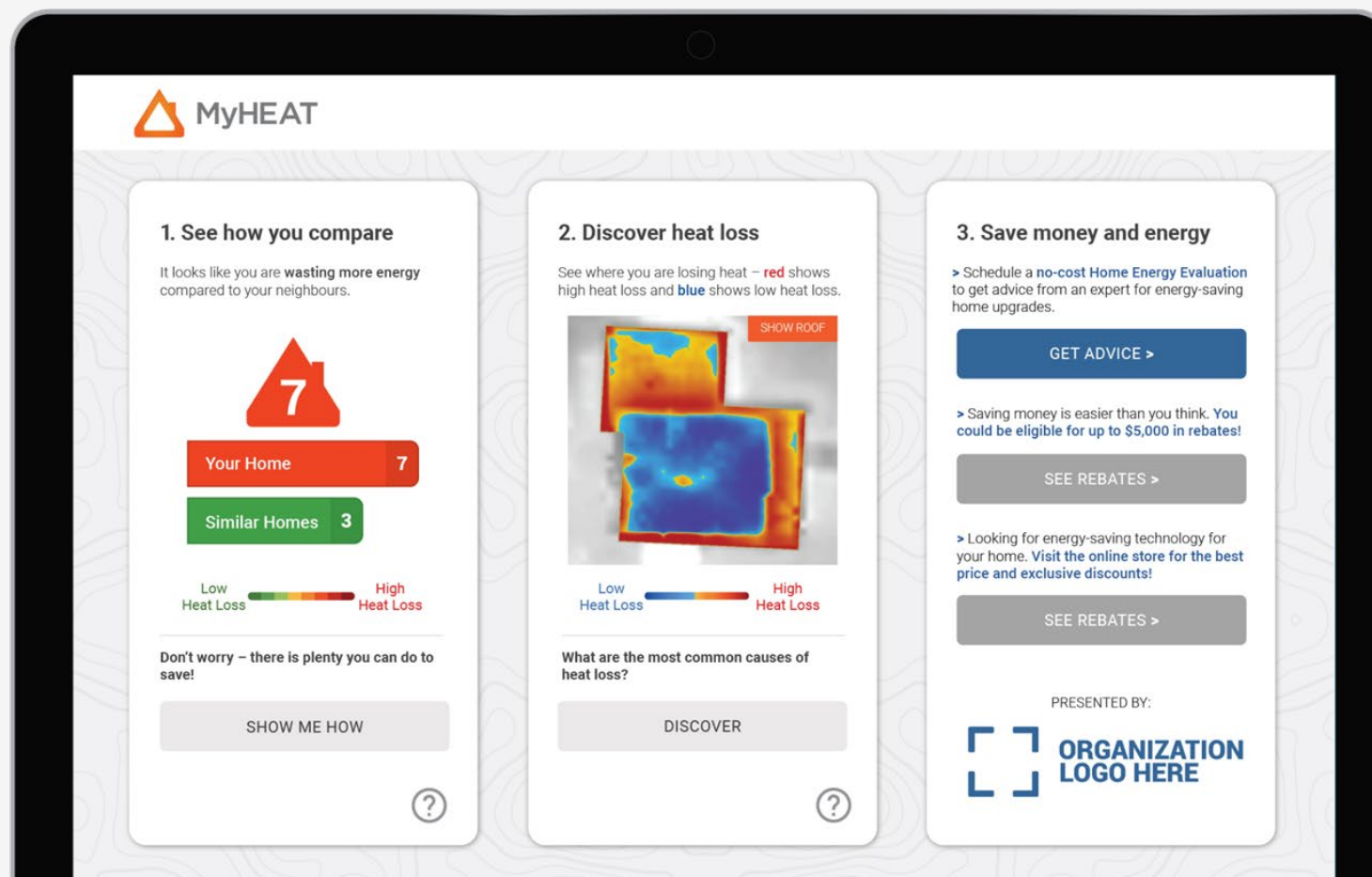
Bay Cloverhill Neighbourhood

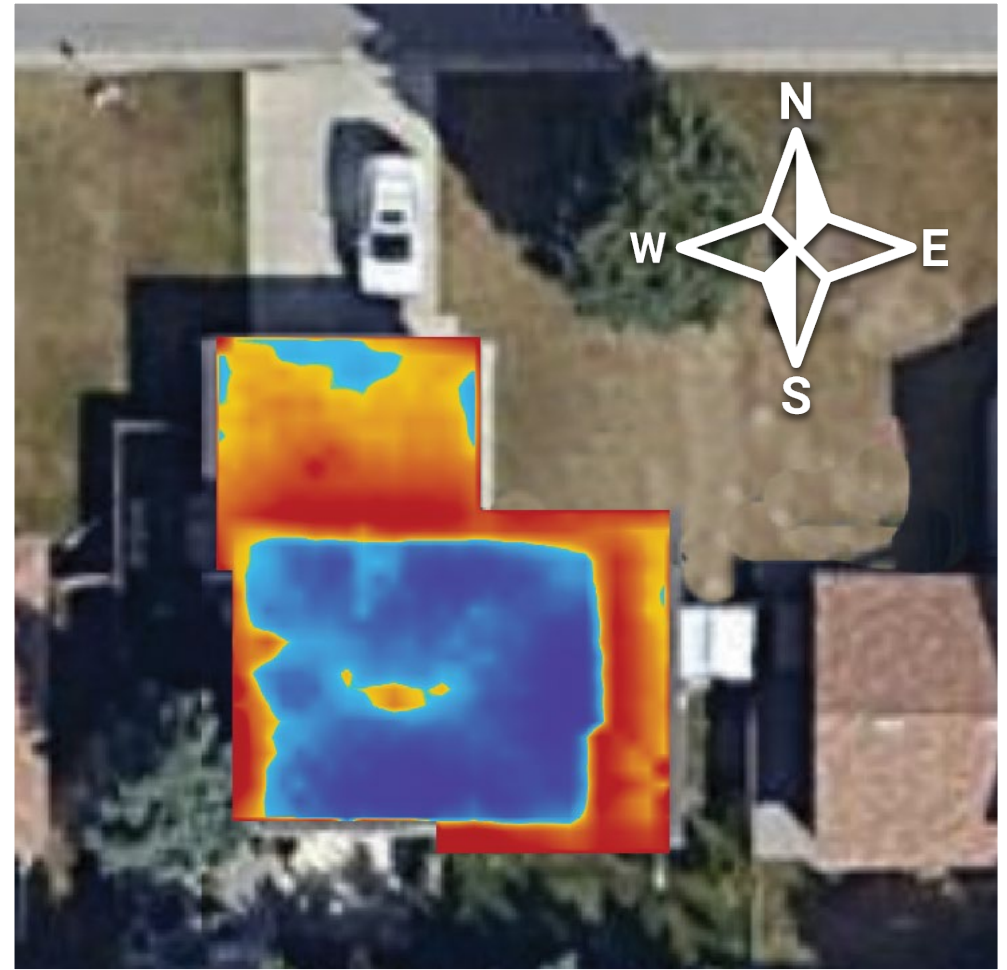
55%
Buildings with extreme heat loss

556
Buildings with a heat rating higher than 5

>\$60K
Avg income

Home HEAT Profiles for homeowner engagement







Improving Energy Efficiency Knowledge

Survey #1



1 in 3

customers clicked
through on the link



875

customers submitted
a survey

- Survey fielding: **August 11-18, 2021**
- **11** were obtained with a limited sample soft launch without incentive
- **864** were obtained with the full launch and offering a \$5 incentive
- Statistically significant results are at the **95%** confidence level
- Occupants were shown their home's profile, similar to prior example

Usefulness, Accuracy, Clarity

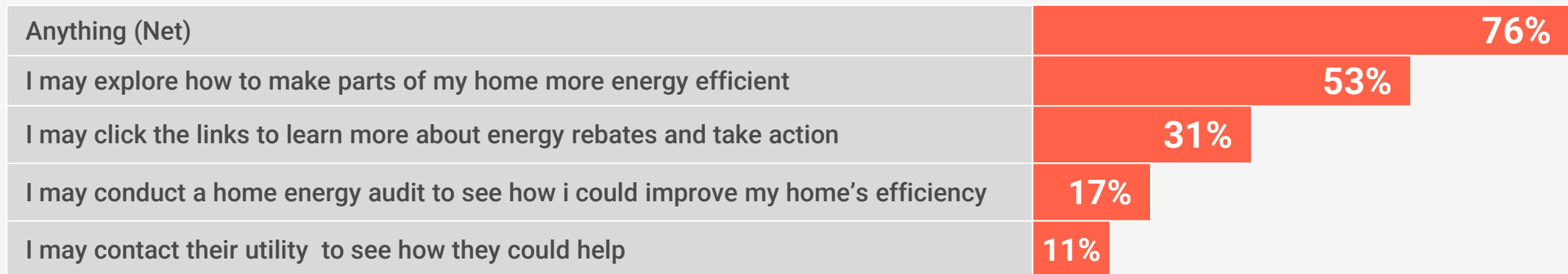
Customers rated the information on usefulness, accuracy and clarity.

	Top 2 Ratings*
Usefulness	83%
Accuracy	80%
Clarity	83%

Three in four customers say their map and energy score would prompt them to take action, with the most common actions being to find out more about their home's energy rating and exploring ways to make parts of their home more energy efficient.

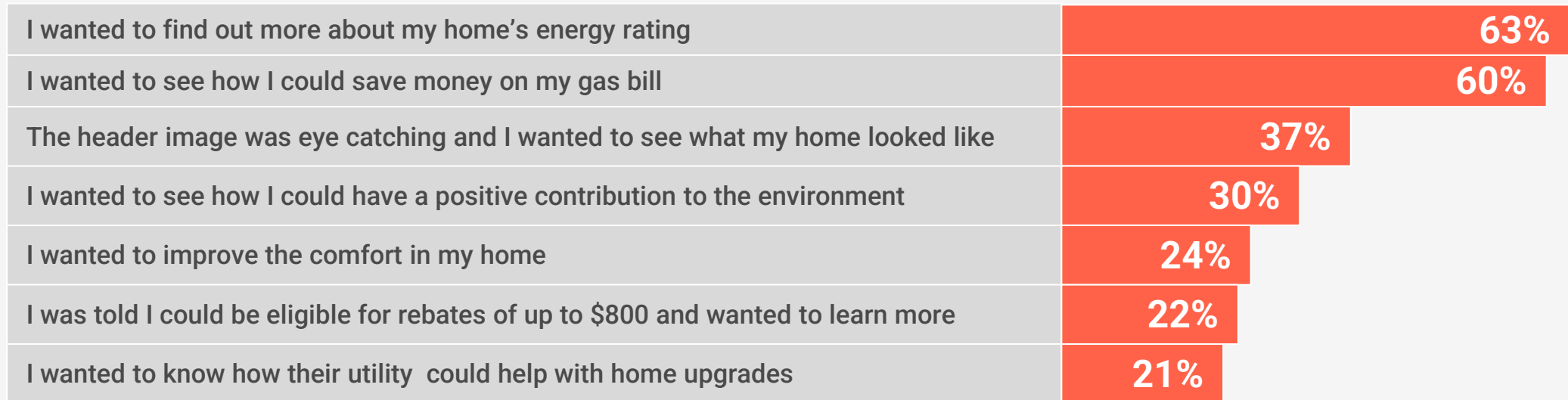
Research / Action After Viewing Thermal Imagery

Three in four customers say their map and energy score would prompt them to take action, with the most common actions being to find out more about their home's energy rating and exploring ways to make parts of their home more energy efficient. Younger customers in particular were likely to take that action.



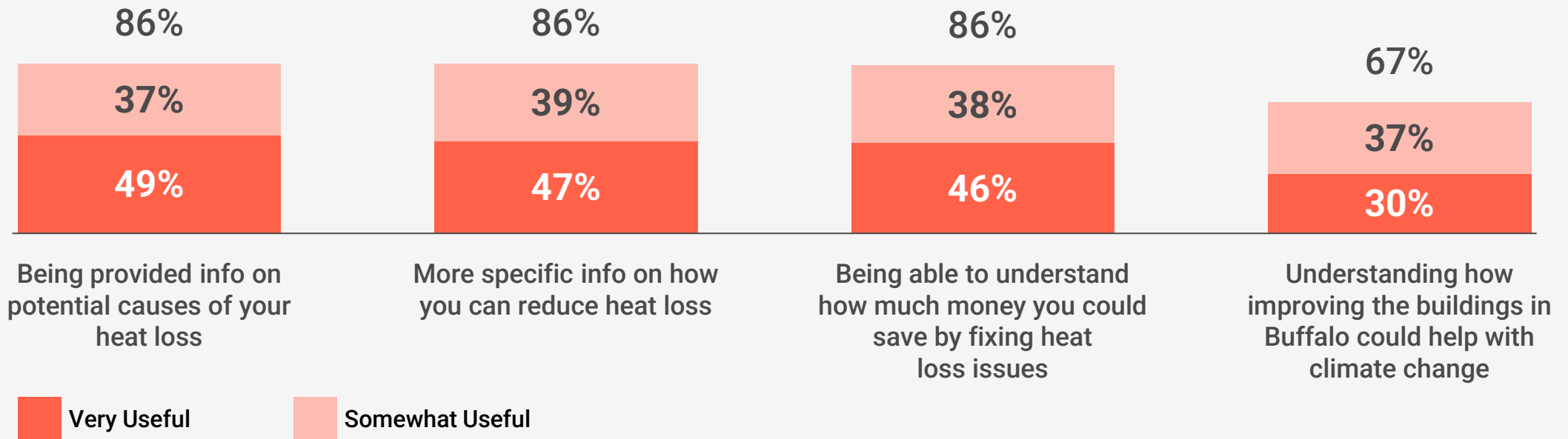
Education Motivation

Among customers who clicked to view their profile, curiosity about their home's energy rating and a desire to find out how to save money on their gas bill were the most popular parts.



Information Usefulness

The most useful information to customers was related to causes of heat loss and how to reduce it and how much money could be saved by fixing heat loss issues. Linking local efficiency improvements with combating climate change ranked last.



Example Engaged Customers

For the most part, the heat loss map was consistent with what I would expect. I did notice a bright red area on it that actually alerted me to a problem with a small window in an out of the way area in my house I don't spend much time near. I was able to perform a repair and rectify a draft I may not have otherwise noticed.

I try to fix the areas in my home when the heat is being lost. I find these emails very informative. It's crazy to see how accurate it is.

I feel bad that my score is so high. The heat map is helpful because I know the architecture of my house and some of the heat loss areas are not well insulated.

Survey #2



1,214

customers were invited
by email to participate
in the survey



809

customers opened
the email



394

customers clicked
through on the link

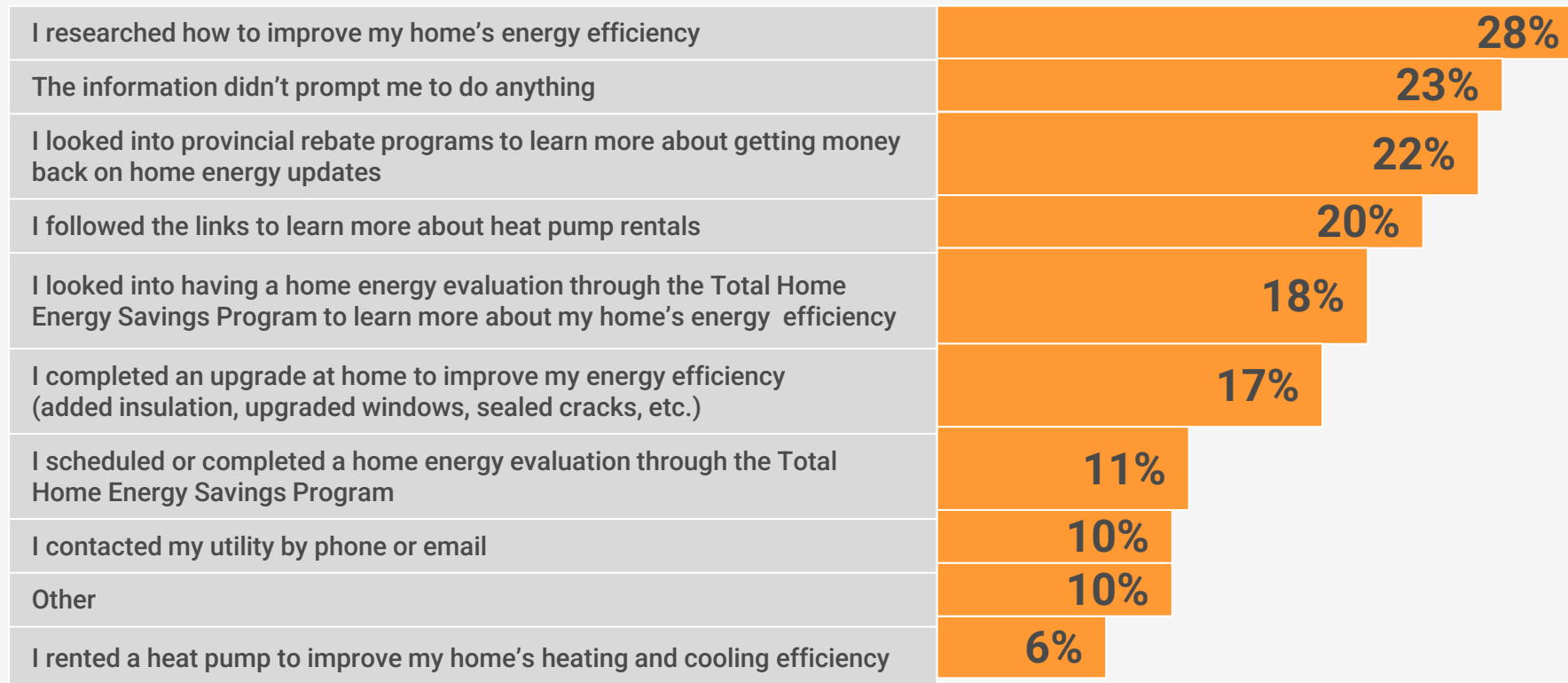


264

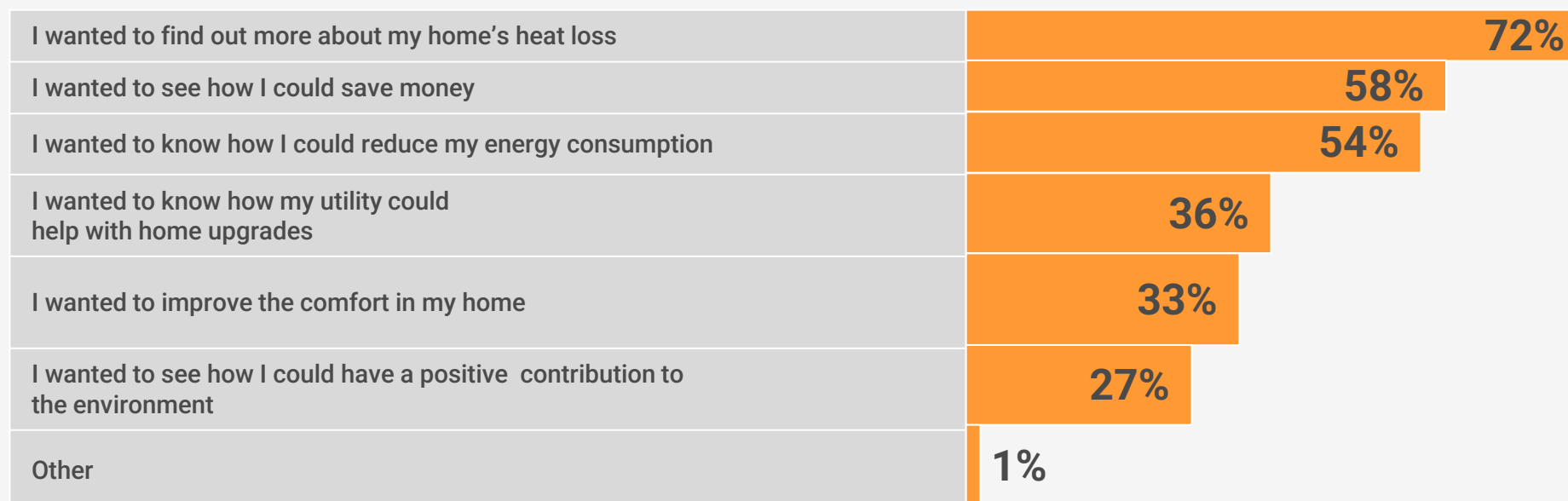
customers submitted
a survey

- Survey fielding: **August 17-24, 2021**

Research / Action After Viewing Thermal Imagery

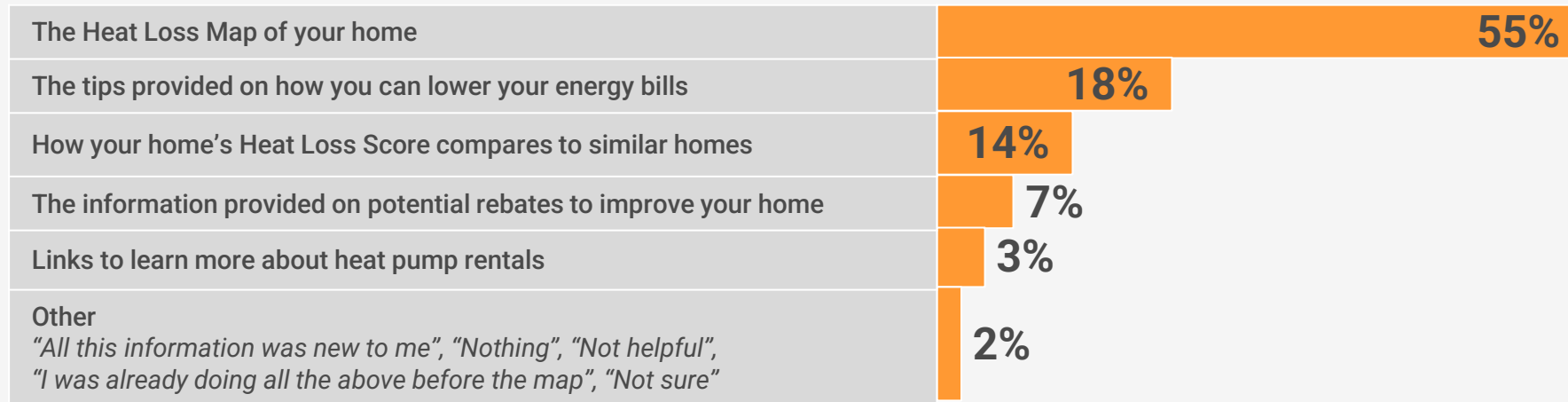


Education Motivation



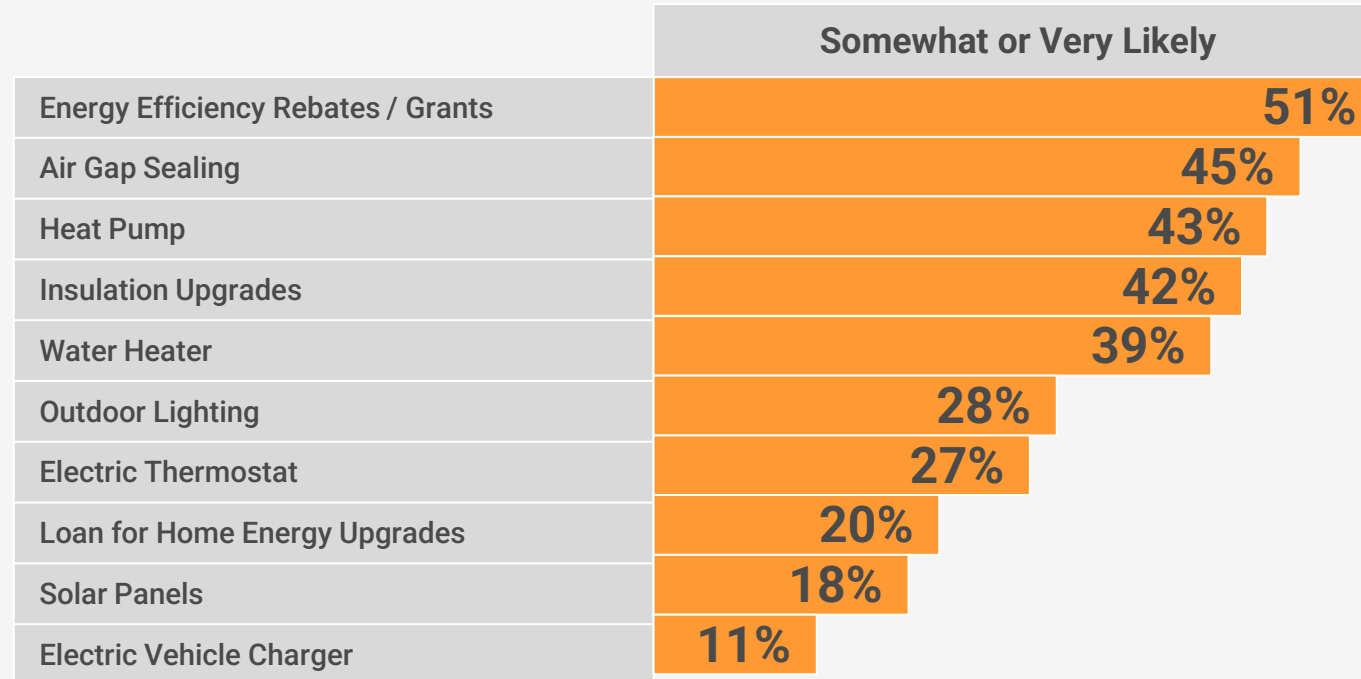
The top driver to use the Home Heat Saver was to learn about **home heat loss**, followed by **how to save money**.

Information Usefulness



The Heat Loss Map was deemed the most valuable element of the program by far. The Heat Loss Rating was rated as less valuable than the money-saving tips.

Spillover From Thermal Efficiency



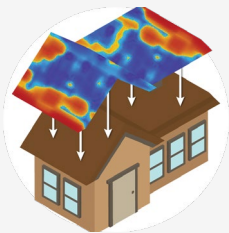


Intentions vs. Actions

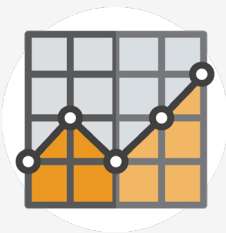
Measured Results: City of Medicine Hat

Summary

Private platform offered in Alberta. Monthly engagements were conducted for ~**12,500** single-family homes via personalized **on-bill messaging** with heat loss details throughout 2018.



Group 1
HEAT Map
& HEAT Rating



Group 2
Traditional Home
Energy Report (HER)



Group 3
Control, receiving
no outreach

Results

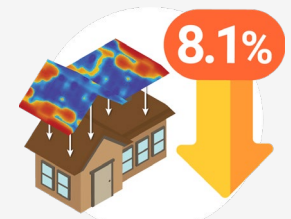
Project applied a randomized controlled trial to evaluate results. An academic team measured consumption and program uptake for treatment and control groups.



30% higher participation
in insulation programs,
compared to
control group

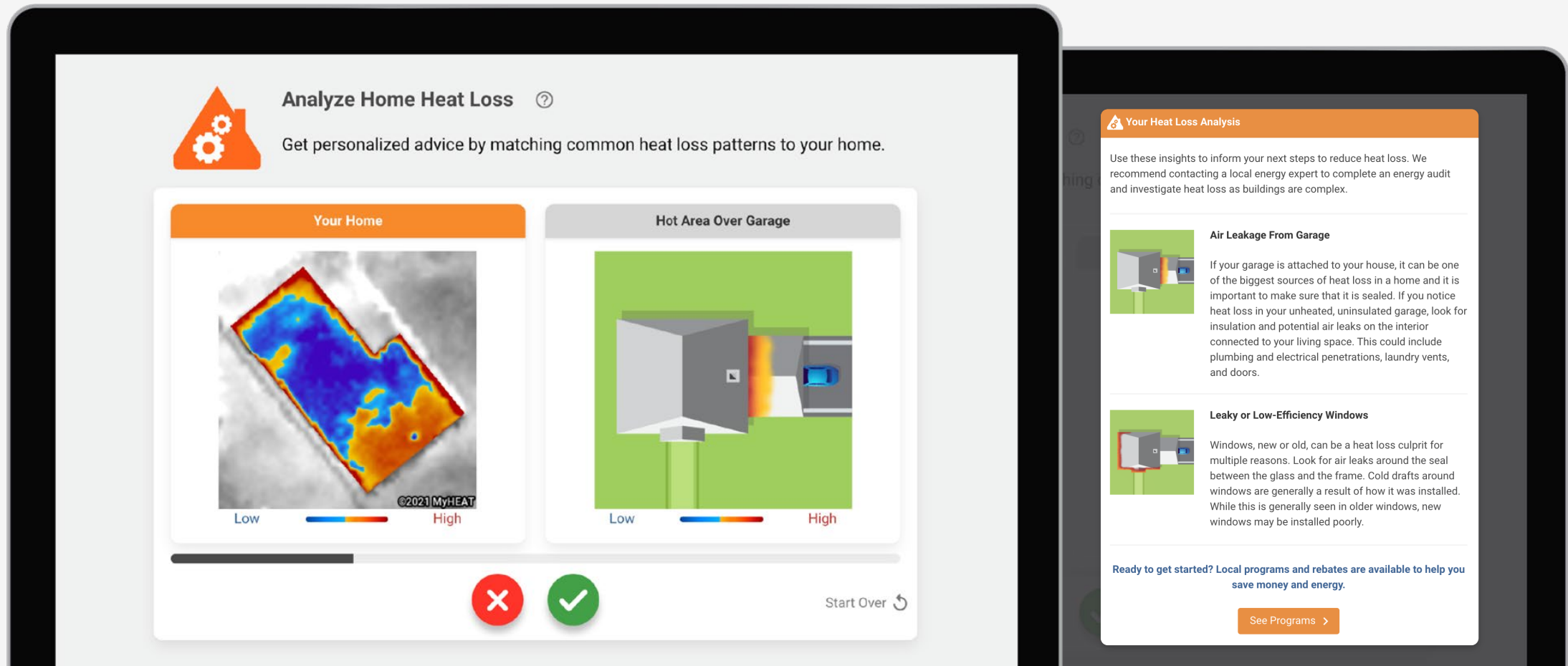


19% more online rebates
for other programs
compared to
control group

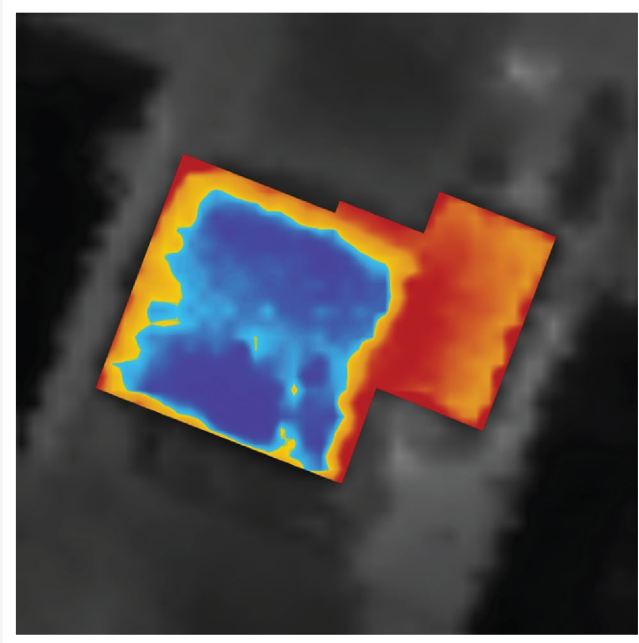


8.1% natural gas consumption reduction
per \$100 of estimated
annual savings

Up Next: Interaction + Targeted Education

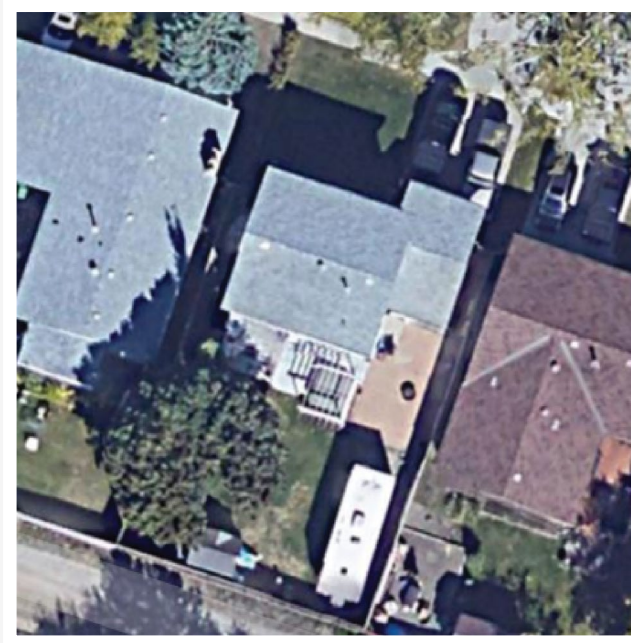


Privacy



HEAT Map

Benign image showing only areas of rooftop heat loss



Google Maps

Can gather a lot more information about occupants



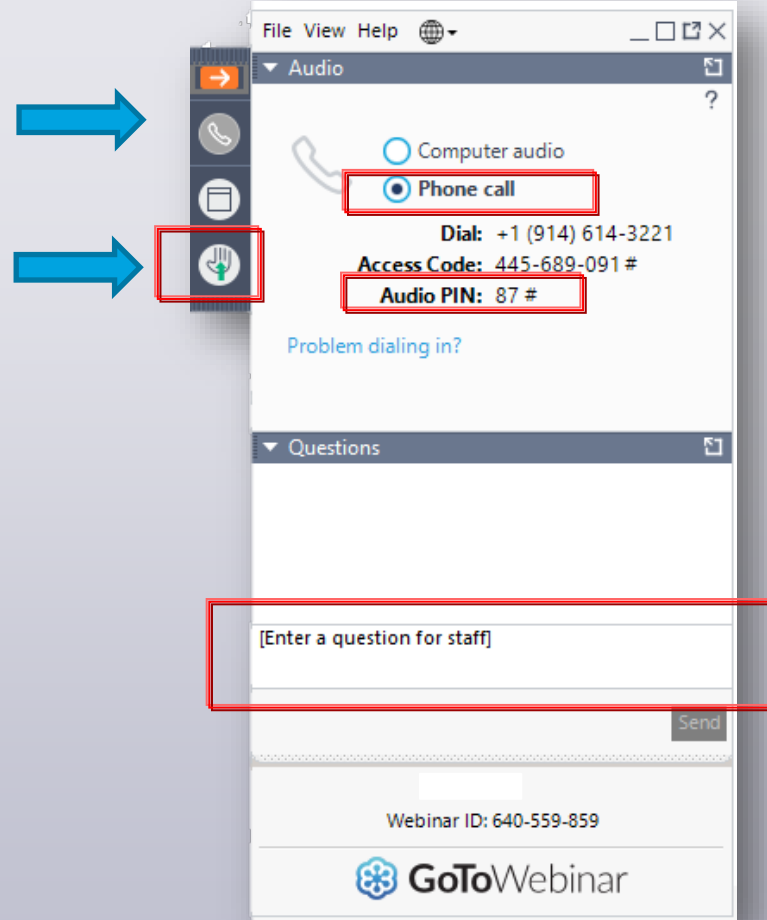
Thank You!

Darren Jones
darren@myheat.ca
403.390.7015

Discussion: Share Your Questions

Open and close
your **control
panel**

**Raise your
hand** to enter
the discussion



Please use the
questions box to
submit questions,
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alert us of
technical
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If you have called in on a phone today, double check that you've selected telephone as your audio option.



Joe Medosch
Healthy Building Scientist
Hayward Score

Register for Peer Exchange Calls

Overcoming Homeowner Lack of Efficiency Knowledge



Overcoming Homeowner Lack of Efficiency Knowledge

Efficient

- achieving maximum productivity with minimum wasted effort or expense.
- preventing the wasteful use of a particular resource (aka conservation)



Question 2

Light Bulbs



According to the U.S. Energy Information Administration (EIA), lighting accounts for what percent of electricity used in the average U.S. home?

5%

10%

15%

20%

<https://www.eia.gov/energyexplained/use-of-energy/homes.php>

ENERGY STAR certified LED bulbs provide the same amount of brightness as traditional incandescent light bulbs, but use up to what percent less energy?

25%

40%

65%

90%



Water Heating (All uses)

Est. based on \$0.13 per kWh

Electric water heater

380–500 kWh per month

\$49.40–\$65.00 per month

Instantaneous (110 v 29 amp) @1gpm 70°F

Instantaneous (240 v 50 amp) @2.5gpm 83°F

Heat pump (50–75 gal) water heater

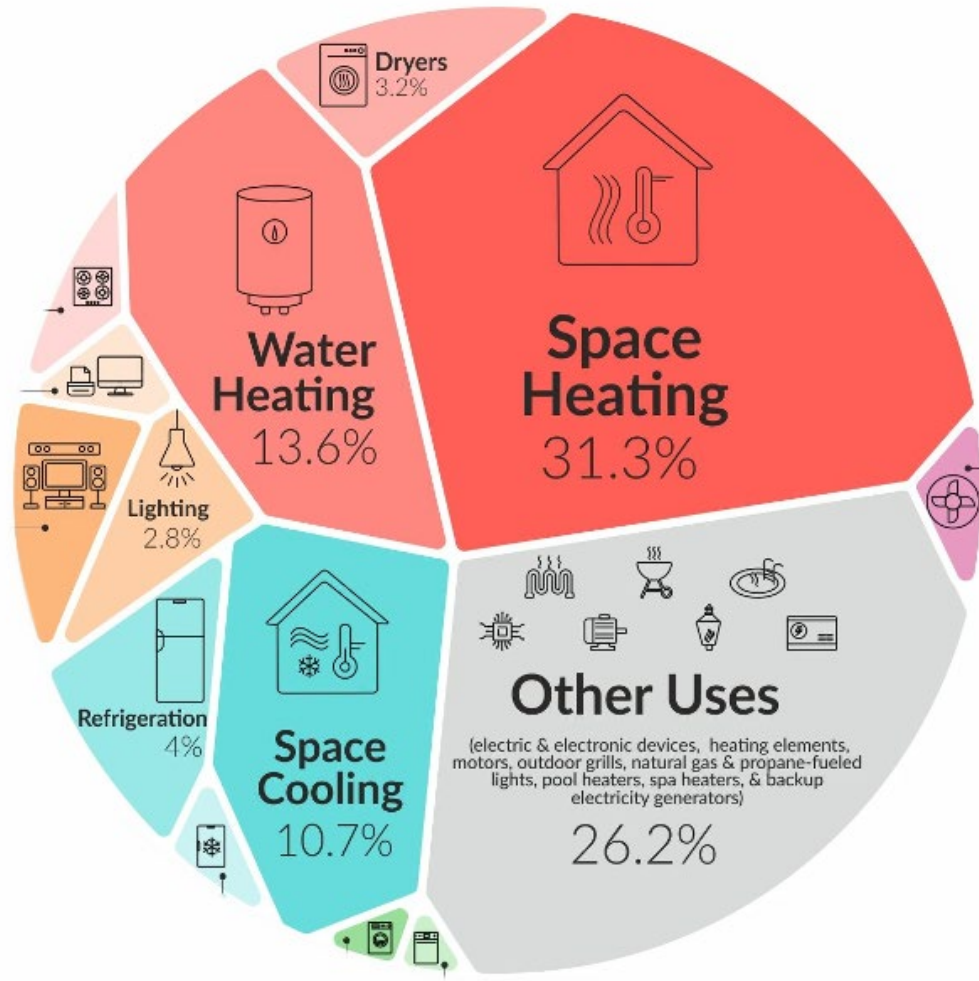
Heat pump (>75 gal) water heater

source: <https://www.siliconvalleypower.com/residents/save-energy/appliance-energy-use-chart>



Residential Energy Use by Appliance

Percentage of Total Gross End-Use Energy Consumption in Single-Family Households

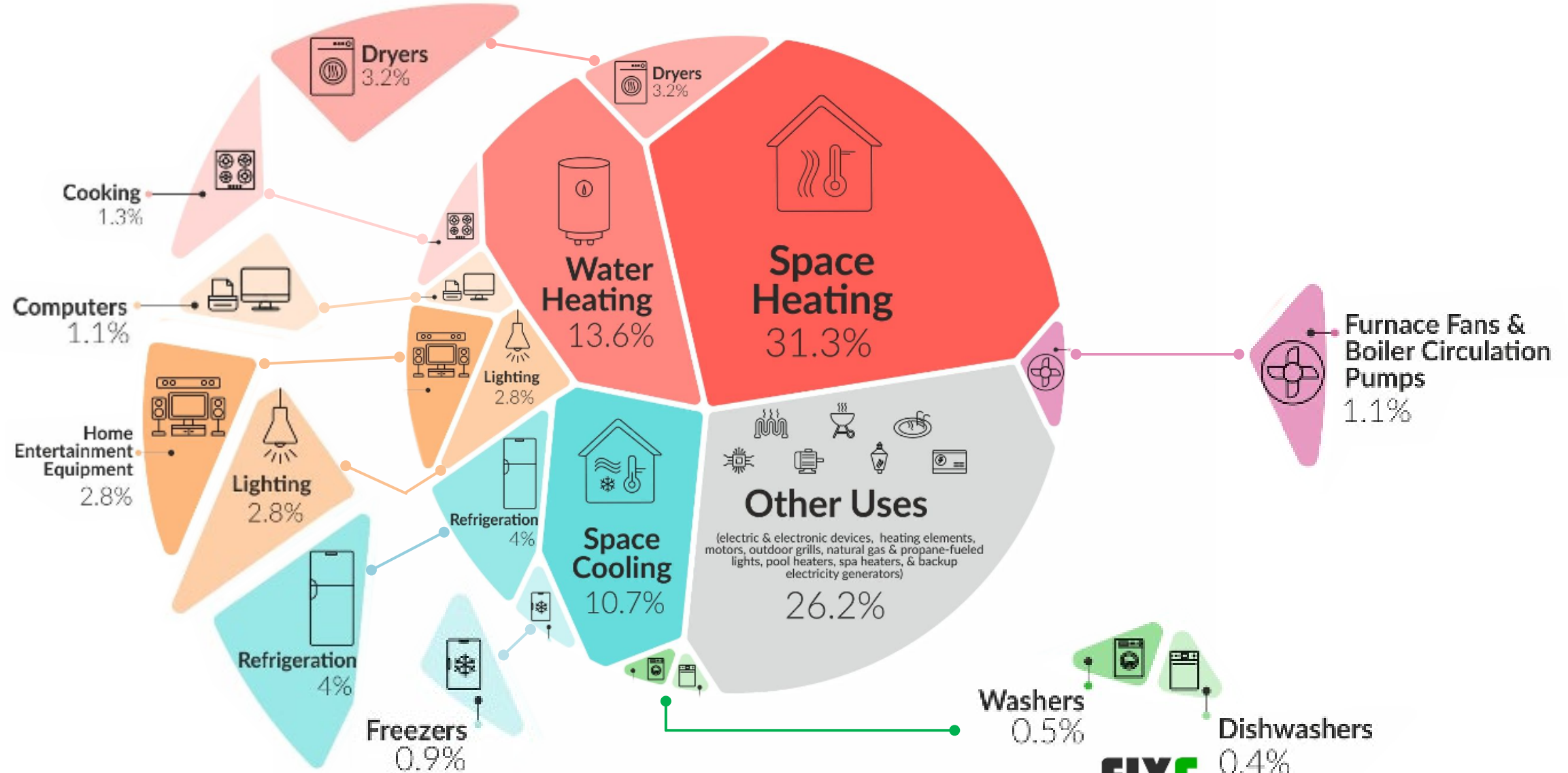


www.fixr.com/blog | Source: U.S. Energy Information Administration (EIA) - Annual Energy Outlook 2021

FIXR

Residential Energy Use by Appliance

Percentage of Total Gross End-Use Energy Consumption in Single-Family Households



www.fixr.com/blog | source: U.S. Energy Information Administration (EIA) - Annual Energy Outlook 2021

FIXR

Dishwashers
0.4%

Washers
0.5%

Utilities

Do you know where your...

Gas meter/shutoff is located?

Water meter/shutoff is located?

Electrical meter/breaker is located?

How much are you paying for a therm?
How many therms do you use a month?
Do you know what a therm is?

How much are you paying for a a gallon of water?

How many gallons do you use a month?

How much are you paying for a a kilowatt of electricity?

How many kWh do you use a month?

How much are you paying for a gallon of gas for your car?



Home Energy Score

U.S. DEPARTMENT OF ENERGY Home Energy Score



- What is a Home Energy Score?
- Who provides it?
- How do I get one?
- Is a “1” good or bad?

Theme: Score is compared to MPG



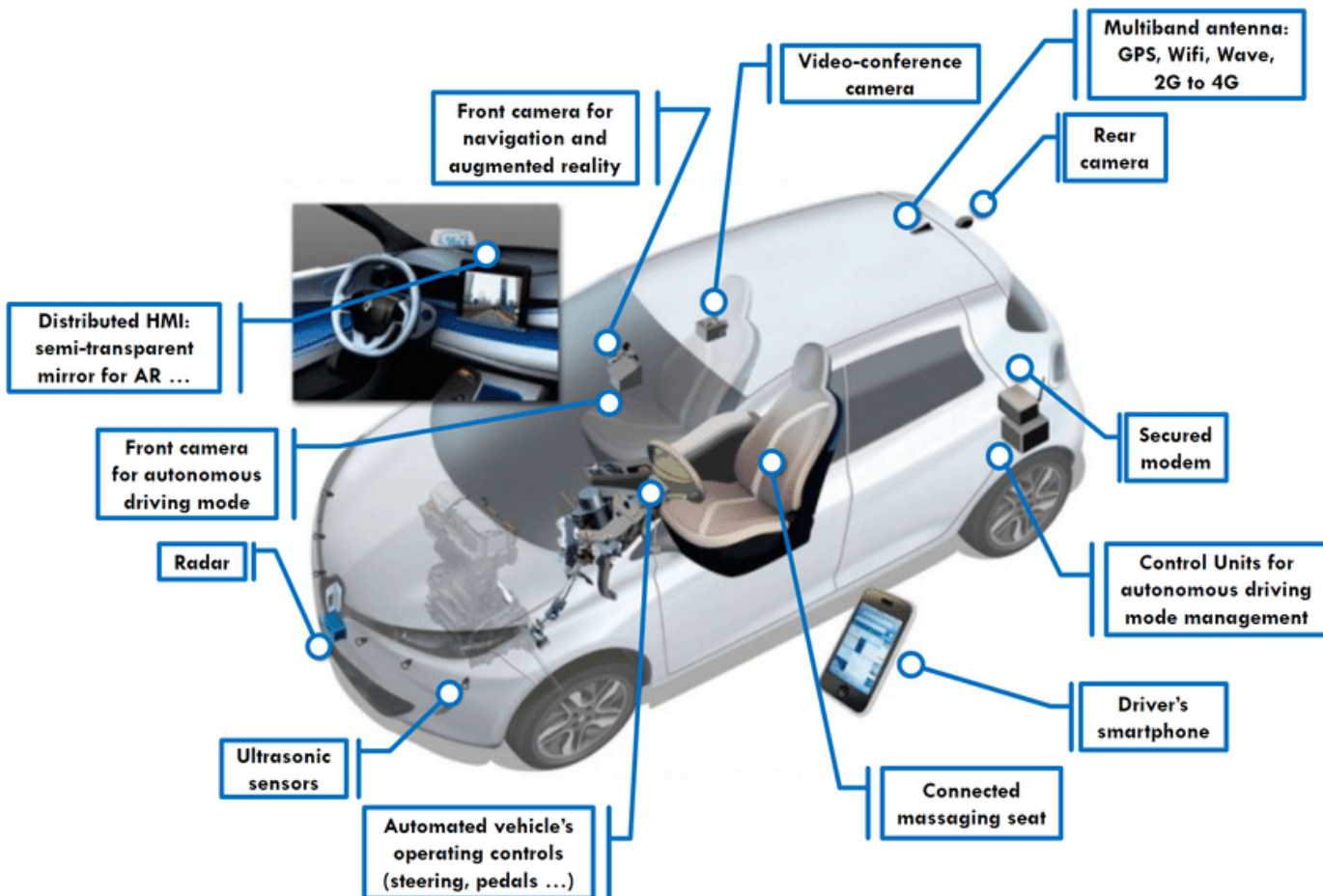
Car	vs.	House
MPG		Home Energy Score / HERS Rating / Tested or estimated
ASE Certified Mechanic		May or may not be certified / licensed
Warranty / Proactive Maintenance		Warranty ?? – Total Failure
Assembly line / Controlled climate		Onsite / Exposed to the weather
Basic maintenance / Change oil		Filters (4+), exterior drainage, gutters, paint, light bulbs, ...
Quiet		Only if envelope and windows are high performance
Climate control – each person		Out of control – room to room
Manual / YouTube		Manual / YouTube!!!
\$37,876 in 2020 / \$45,031 in 2021		\$389,400 in 2020 / \$408,800 in 2021

We use our cars.

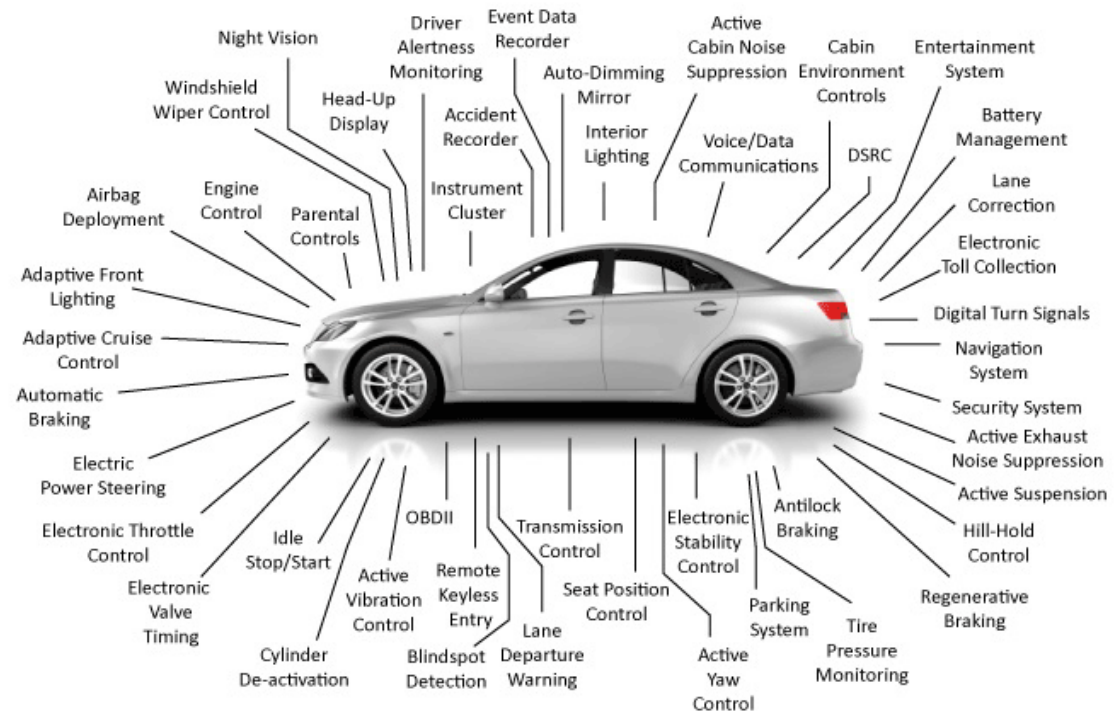
**Do we use our homes?
Or do we just “do things” in them!**



Why are home owners not "opening the doors," to make their homes healthier?



Electronic Components in a Modern Vehicle



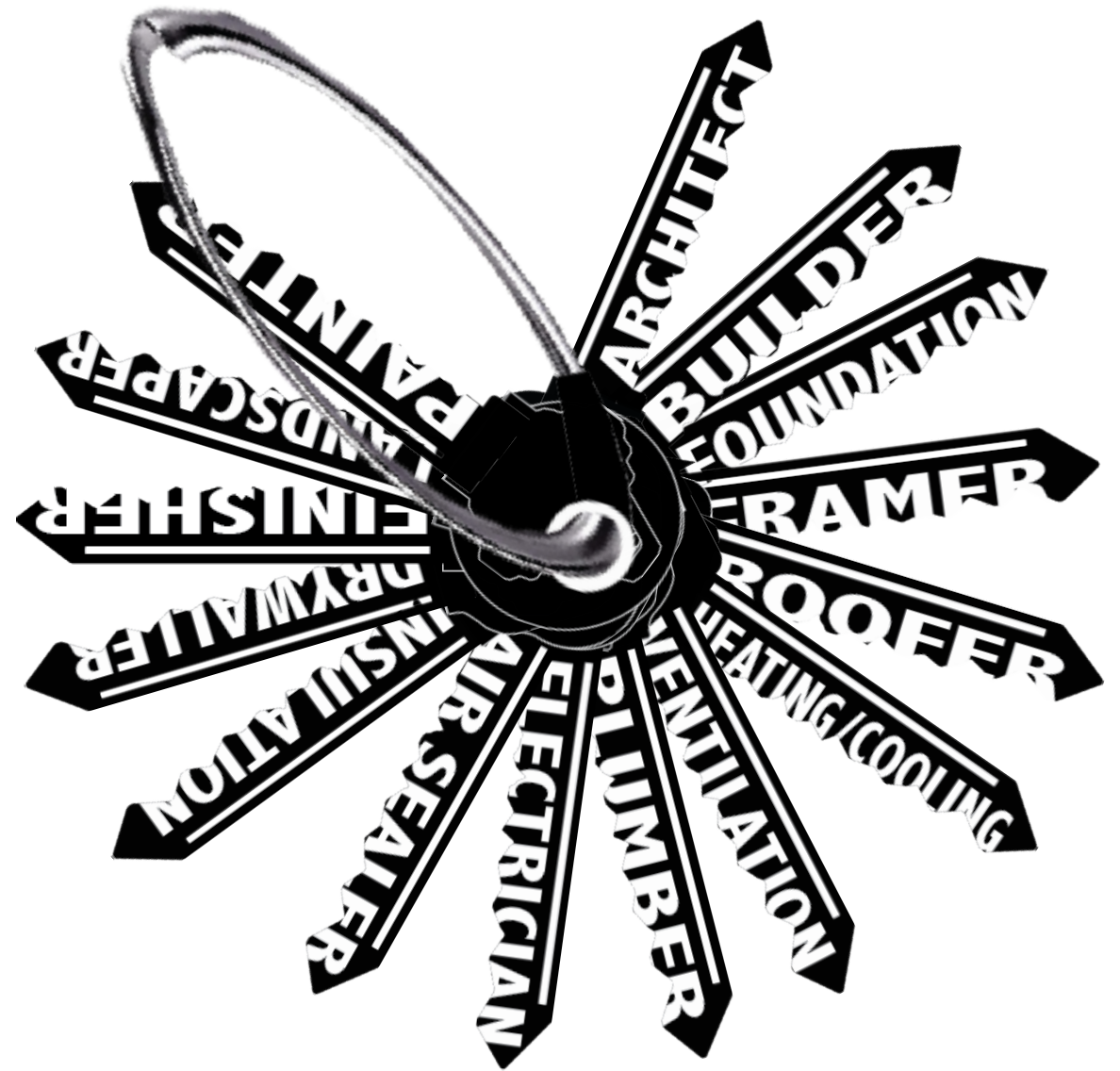
Why are home owners not "opening the doors,"
to make their homes healthier?

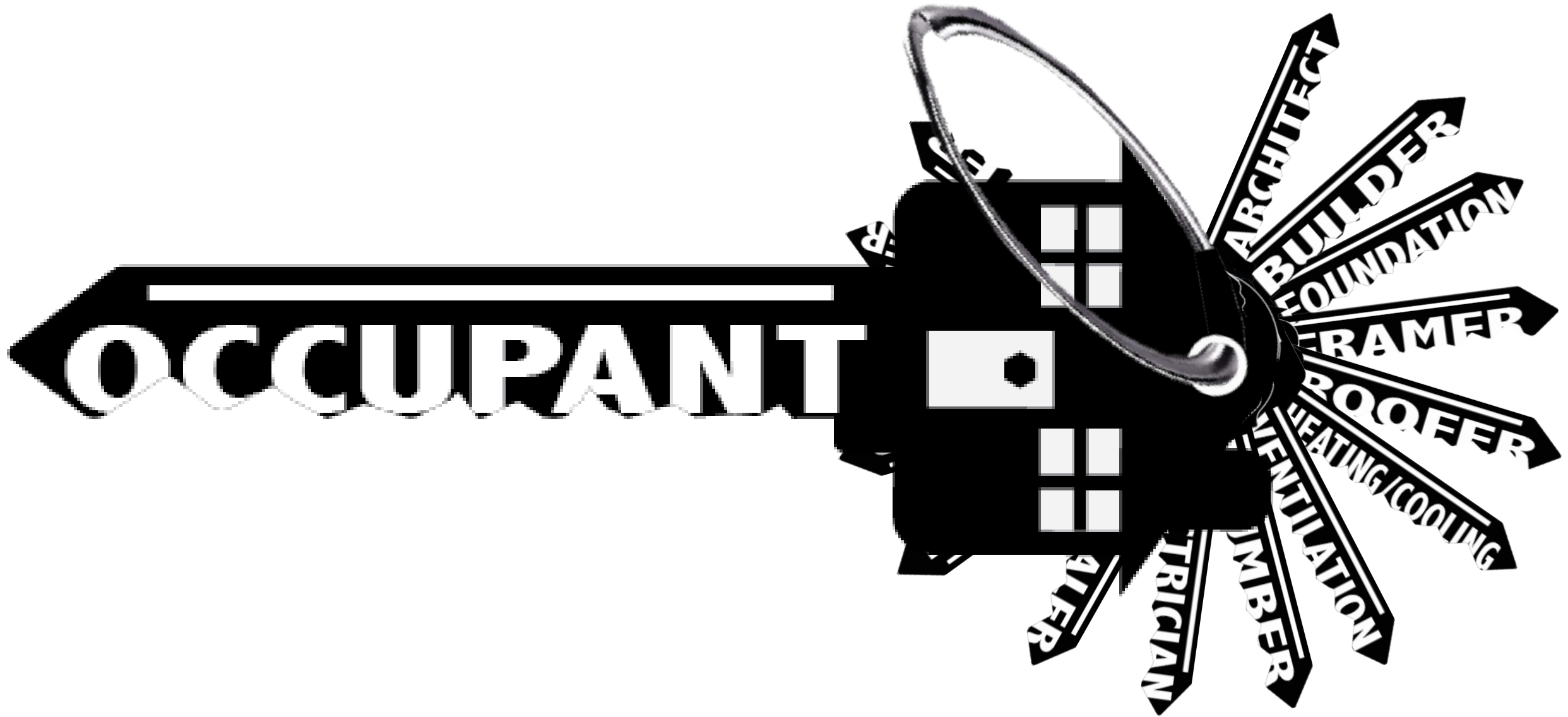


IF CARS WERE BUILT LIKE HOUSES



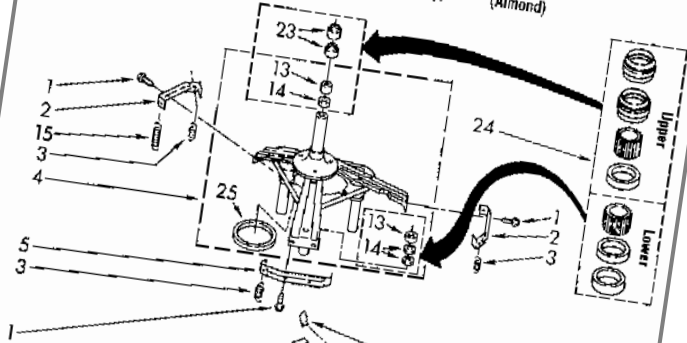
<https://youtu.be/YnIXclQtHvc>





MACHINE BASE PARTS

For Models: 110.92195110, 110.92195510, 110.92195810
(White) (Ebony) (Almond)



KitchenAid® Installation Instructions

Undercounter Dishwasher



IMPORTANT: Leave installation instructions with the homeowner. Keep installation instructions for future reference. Save installation instructions for local electrical inspector's use.

Part No. 4171006

Before you start...

- Proper installation is your responsibility. Make sure you have everything necessary for correct installation. It is the personal responsibility and obligation of the customer to ensure that electrical and plumbing installation meets national and local codes and ordinances.
- Check location where dishwasher will be installed. The location should provide:
- Easy access to water, electricity and drainage.
 - Convenient loading — the best position is left or right of kitchen sink.
 - Clearing that is square for proper dishwasher operation and appearance.
 - Cabinet front that is perpendicular to floor.
 - Protection against freezing to prevent the water inlet valve, water lines to dishwasher, water lines in dishwasher, and drain from lines in dishwasher, (Refrigerator freezing not covered by the warranty.)
 - 1/4" minimum clearance between motor and flooring to prevent motor overheating.

Homeowners Manual



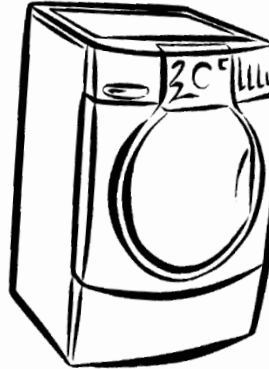
HE3t

Front-Loading Automatic Washer

Owner's Manual and Installation Instructions

Lavadora automática de carga frontal
Manual del propietario e Instrucciones de instalación

Laveuse automatique à chargement frontal
Manuel de l'utilisateur et Instructions d'installation



4. Insert a rear leveling leg into the hole in the rear corner on the bottom of the washer/dryer. Turn leg to the other leveling leg in the other rear corner.

5. Push up one leg and check to see that the washer/dryer is level. Check the other leg the same way. (If legs do not adjust, repeat Step 4.)

6. With one of the front legs in hand, check the edges for a distorted reading. Then move the leg to a position to go into the hole. Push leg into the hole into the hole in the front corner by hand.

9. Remove the front of the washer/dryer. Remove the front of the washer/dryer. Do not remove the front of the washer/dryer until the water/dryer is in place.

7. Place a piece of cardboard in front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

8. With the corner ports in place, cut the corner down one of the corner ports.

10. Move the front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

11. Push the front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

12. Remove yellow card. Take hose out of box. Place hose with other parts.

13. Remove water hose. Push hose into the hole. Push the hose into the hole. Push the hose into the hole.

14. Push the front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

15. Push the front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

16. Push the front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

17. Push the front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

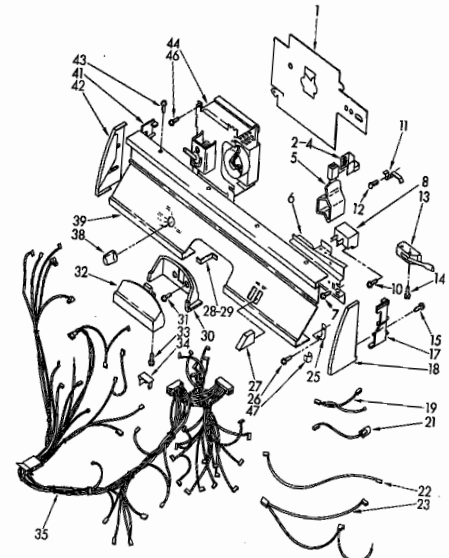
18. Push the front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

19. Push the front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

20. Push the front of the washer/dryer. Push the washer/dryer into the hole. Push the washer/dryer into the hole. Push the washer/dryer into the hole.

CONTROL PANEL PARTS

For Model: KUDH220T-0



LENNOX



INSTALLATION INSTRUCTIONS

ML180UHE

MERIT® SERIES GAS FURNACE
UPFLOW HORIZONTAL AIR DISCHARGE

504913-01
9/2011
Supersedes 506732-01

Technical Information
Lennox U.S.A.

THIS MANUAL BE LEFT WITH THE HOMEOWNER FOR FUTURE REFERENCE

This is a safety alert symbol and should never be ignored. When you see this symbol on labels or in manuals, be alert to the potential for personal injury or death.

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional installer (or equivalent), service agency or the gas supplier.

CAUTION

As with any mechanical equipment, personal injury can result from contact with sharp sheet metal edges. Be careful when you handle this equipment.

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Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Onboarding Builder-X



Builder-X ... Crowdsourced

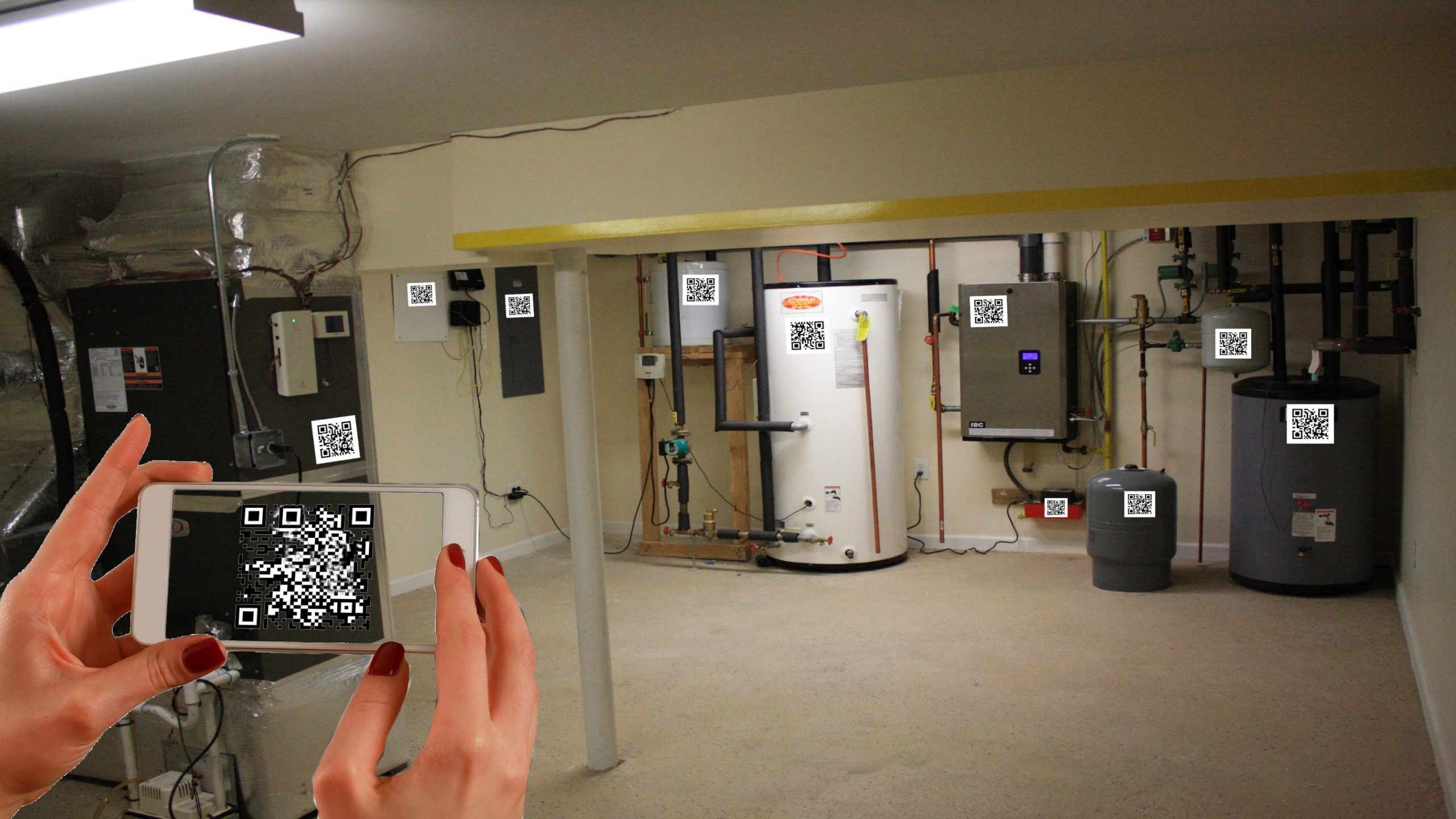
- Peer-to-peer resource center
- Collective wisdom

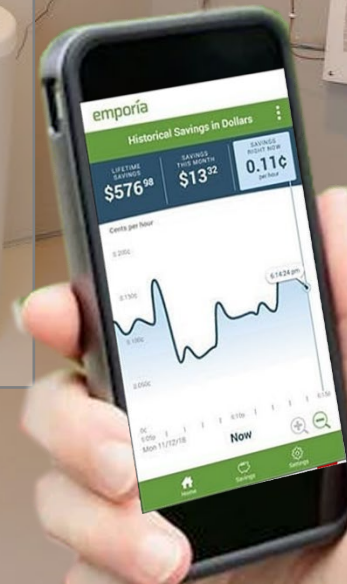
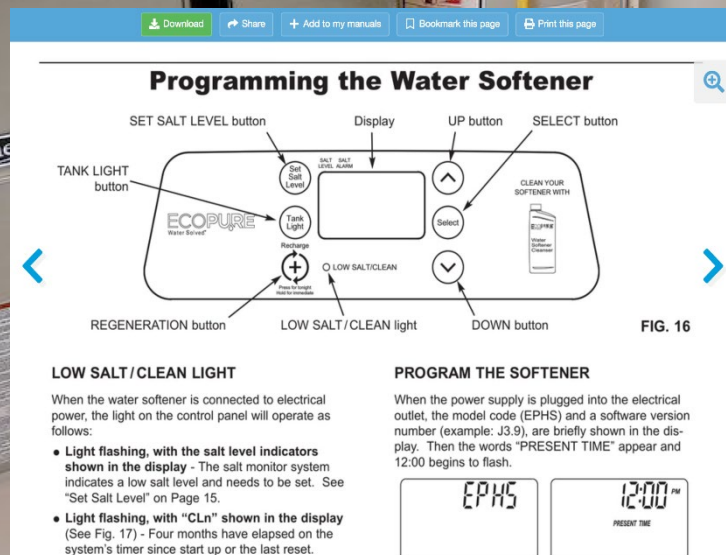
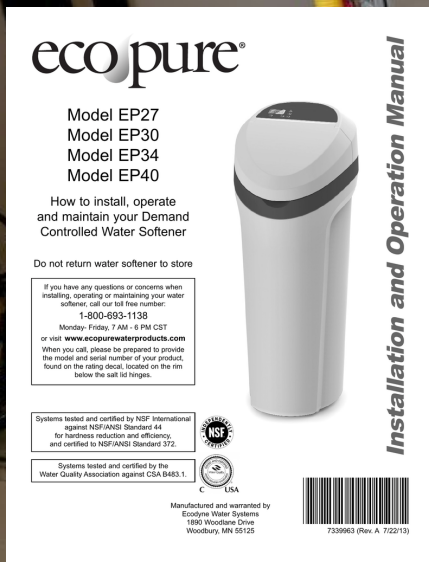
Builder-X ...

Online Community Network
Knowledge
Homeowner Support

Builder-X *app*

- Are you a first time homeowner?





How to Overcome Homeowners Lack of Efficiency Knowledge

Develop a Relationship.

- Speak their language the way they communicate – social speak!
- Provide useful information on their home thru media campaigns.
- Provide real preventative maintenance options and timely recommendations.
- Create educational informative commercials – industry wide.



Thank You

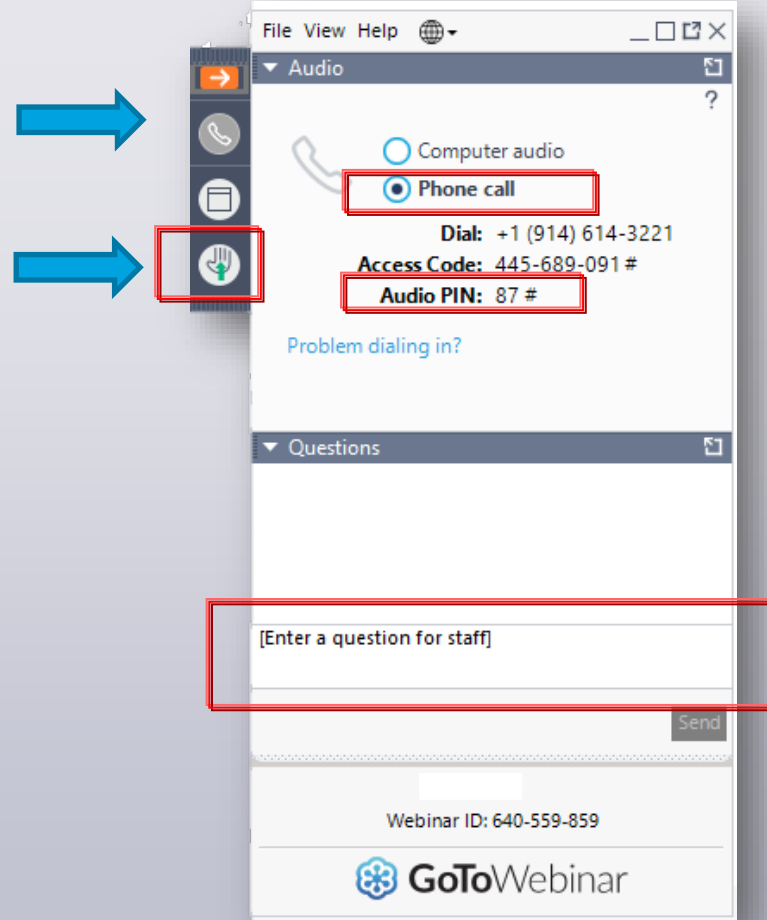
joemedosch@gmail.com



Open Discussion

Open and close
your **control
panel**

Raise your
hand to enter
the discussion

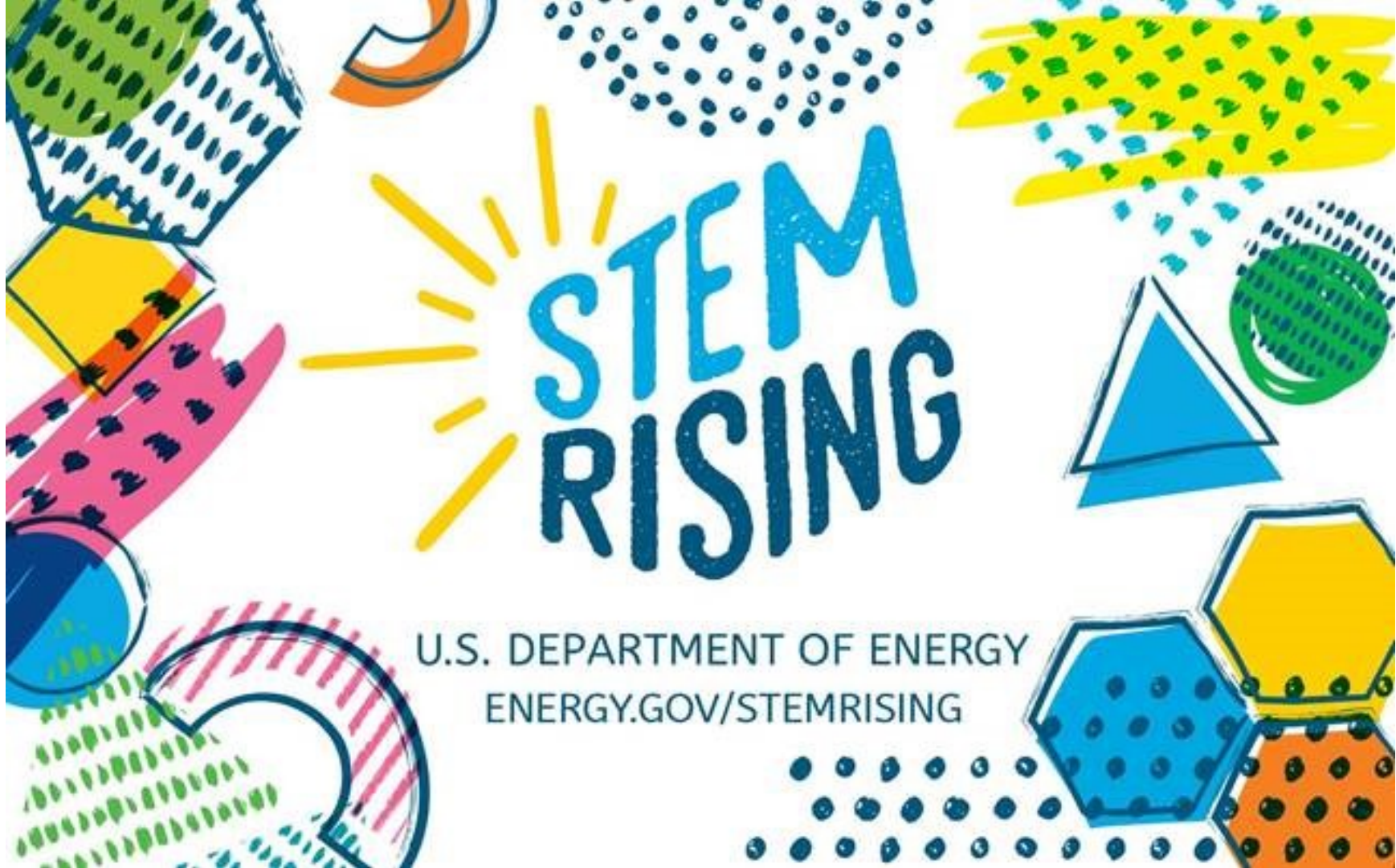


Please use the
questions box to
submit questions,
comments, or
alert us of
technical
difficulties

If you have called in on a phone today, double check that you've selected telephone as your audio option.

Closing Poll

- **After today's call, what will you do?**
 - Consider implementing one or more of the ideas discussed
 - Seek out additional information on one or more of the ideas
 - Make no changes to your current approach
 - Other (please explain)

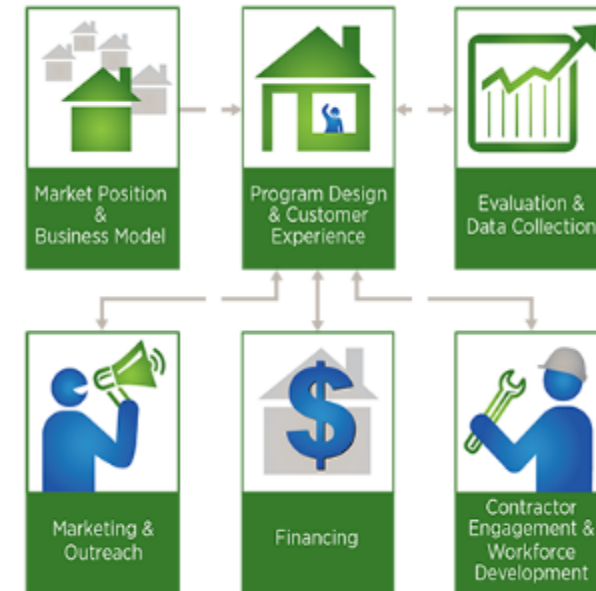


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Explore the Residential Program Solution Center

Resources to help improve your program and reach energy efficiency targets:

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- [Quick Answers](#) - provide answers and resources for common questions.
- [Proven Practices](#) posts - include lessons learned, examples, and helpful tips from successful programs.
- [Technology Solutions](#) **NEW!** - present resources on advanced technologies, **HVAC & Heat Pump Water Heaters**, including installation guidance, marketing strategies, & potential savings.



<https://rpssc.energy.gov>

Thank You!

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Please send any follow-up questions
or future call topic ideas to:
bbresidentialnetwork@ee.doe.gov